JOURNAL
of
FARM ECONOMICS

VOL. X OCTOBER, 1928 No. 4

THE UNITED STATES GOVERNMENTAL ACTIVITIES IN THE FIELD OF AGRICULTURAL ECONOMICS PRIOR TO 1913

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During the few years prior to the World War, increasing costs of living and a declining agricultural price level caused attention to be centered on the problems of marketing and farmers' profits. Many colleges and universities began teaching agricultural economics and marketing. Several States, through different departments, started studies of the farmers' economic and marketing problems, and inaugurated some control work. Cities, civic groups, farmers' associations, and other interests turned their attention to these matters. To attack these problems better, the United States Department of Agriculture established an Office of Markets, which began to function on May 16, 1913.

Economics was popularized during the war. The emergencies of that period caused a great expansion of the work in this field. Peace brought its difficulties, especially for the farmer. To meet the situation more effectively, the economic work of the Department of Agriculture was re-organized, and the Bureau of Agricultural Economics was established July 1, 1922.

Most people think that governmental work in marketing started with the establishment of the Office of Markets in 1913. An inquiry into the records, however, shows that

traces of the work now carried on by the Bureau of Agricultural Economics can be found as far back as 1839, statistical work being the first agricultural activity of the government. There have been many changes in the type of organization and in the economic work conducted by the Government since the small beginning was made almost one hundred years ago. The development of this work which finally became centered in the Bureau of Agricultural Economics is shown in the accompanying chart.

The development of agricultural economic thought and governmental work which paralleled this organization is shown in the excerpts and discussion which follow.

Statistics

An examination of the official agricultural literature of the earlier years shows that leaders were first concerned about statistics so that agriculture could be properly directed, and it was realized then, as now, that the farmer should be concerned with something more than the production of large crops.

> Our object should not be so much to stimulate to larger production as to open the ways and means by which the husbandman shall have a market, and shall know his labor and skill may be most available. For this purpose he needs a yearly and more full survey of the crops, the markets, and prices than he can now have.[1]

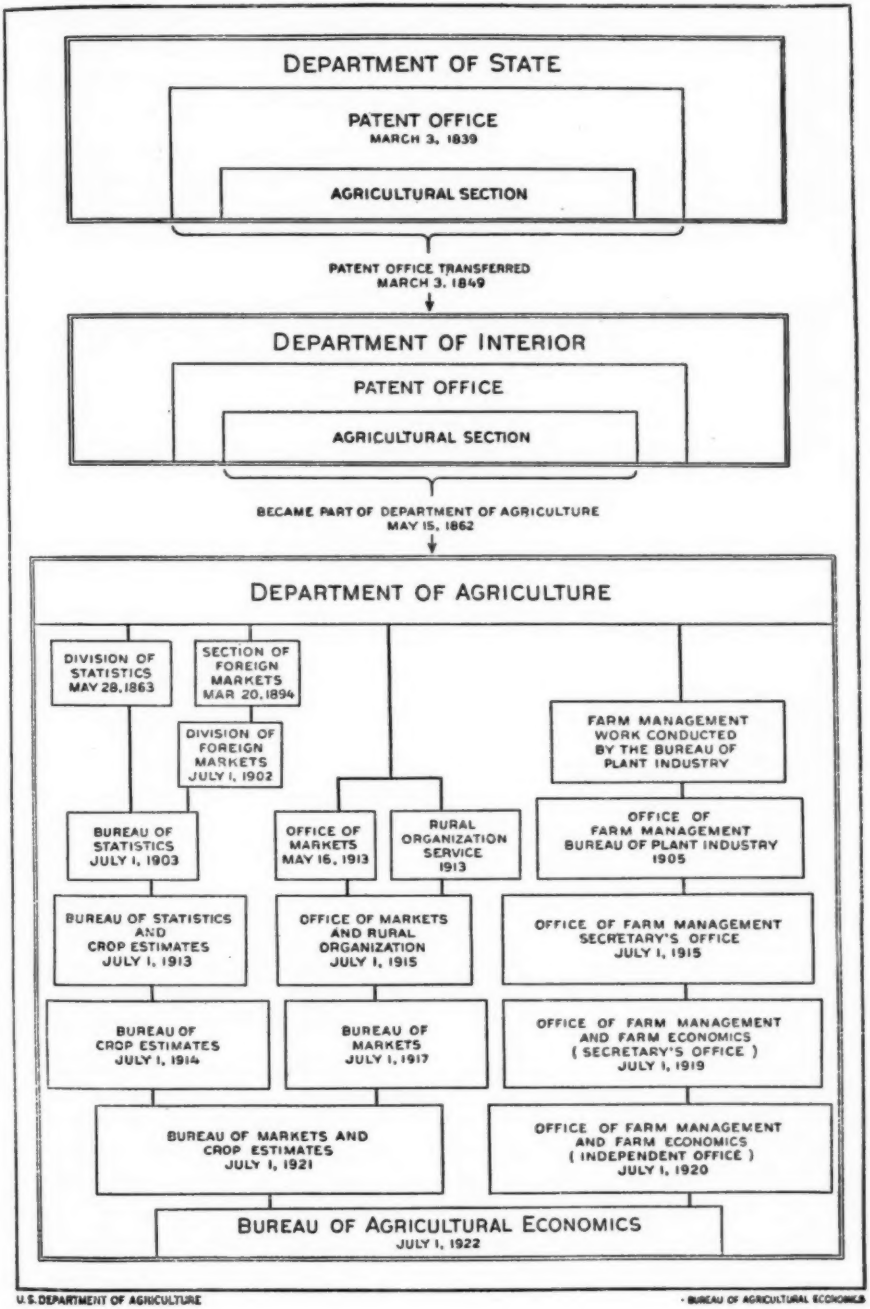
Statistics were to be something more than a mere recital of what had been the results of the past.

> It is our intention, if not disappointed in the effort we have made, to give the latest estimate as to the probable demand on our agricultural resources for the supply of other nations, and to furnish a comparative list of prices of the various articles which come into market at home or abroad.[2]

It was also suggested that information should be gathered concerning the trade of the country, the force of labor and its distribution, new enterprise which might be developed, and competitive conditions in foreign markets.[3]

Because of the limited funds, the lack of trained men, and the difficulties of communication, the agricultural statistical work of the Government was rather crude during the early years of its history; but its importance was recog-

The references indicated by superior numerals are cited at the end of this article.


DEPARTMENT OF STATE
PATENT OFFICE
MARCH 3, 1839
AGRICULTURAL SECTION
PATENT OFFICE TRANSFERRED
MARCH 3, 1849
DEPARTMENT OF INTERIOR
PATENT OFFICE
AGRICULTURAL SECTION
BECAME PART OF DEPARTMENT OF AGRICULTURE
MAY 15, 1862
DEPARTMENT OF AGRICULTURE
DIVISION OF STATISTICS MAY 28, 1863
SECTION OF FOREIGN MARKETS MAR 20, 1894
DIVISION OF FOREIGN MARKETS JULY 1, 1902
FARM MANAGEMENT WORK CONDUCTED BY THE BUREAU OF PLANT INDUSTRY
BUREAU OF STATISTICS JULY 1, 1903
OFFICE OF MARKETS MAY 16, 1913
RURAL ORGANIZATION SERVICE 1913
OFFICE OF FARM MANAGEMENT BUREAU OF PLANT INDUSTRY 1905
BUREAU OF STATISTICS AND CROP ESTIMATES JULY 1, 1913
OFFICE OF MARKETS AND RURAL ORGANIZATION JULY 1, 1915
OFFICE OF FARM MANAGEMENT SECRETARY'S OFFICE JULY 1, 1915
BUREAU OF CROP ESTIMATES JULY 1, 1914
BUREAU OF MARKETS JULY 1, 1917
OFFICE OF FARM MANAGEMENT AND FARM ECONOMICS (SECRETARY'S OFFICE) JULY 1, 1919
BUREAU OF MARKETS AND CROP ESTIMATES JULY 1, 1921
OFFICE OF FARM MANAGEMENT AND FARM ECONOMICS (INDEPENDENT OFFICE) JULY 1, 1920
BUREAU OF AGRICULTURAL ECONOMICS
JULY 1, 1922
U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS

nized, and statistical data were gathered wherever and whenever possible. The main sources of the early information were reports from correspondents, newspapers, and trade journals, and answers to questionnaires sent out from Washington. In circulars sent out by the Commissioner of Patents in 1852, 1854, and 1856, the following questions were included:

1. Cost of transportation
2. Cost of production
3. Market value
4. Methods of harvesting, storing, and preparation for market

One of the early "interrogatories" listed 1,710 questions.[4] This indicates that the early statisticians had much to learn about gathering information.

The early reports carried data concerning the acreage, crop production, number of livestock, imports and exports, shipments from different ports, and prices. Not only were statistics of trade in the staples and foreign trade published; but quite early New York City milk receipts by rail were given to show the extent and growth of that business.[5]

Reasons for the publications of foreign statistics were given in the report of 1855, and show that a knowledge of markets was considered essential.

> Some apology would seem to be due for the large amount of foreign statistics which are contained in this report; but this is regarded by many quite as essential as the statistics of our own country, in order that we may know who are our competitors and where an opening may occur for the sale of our products.[6]

Throughout the entire history of the agricultural statistical work of the Government, emphasis has been placed on the importance of giving as much information as possible concerning the prices of agricultural produce. Semi-annual wheat prices for the pervious four years were published in 1844.[7] Prices of corn, butter, cheese, milk, wool, hogs, horses, and other products are found in almost every one of the early reports. These early quotations were local prices reported by correspondents. It is interesting to note the great differences between the reported prices of various products in different sections of the country in the earlier

years. For example, butter prices reported in 1855 ranged from 10 cents a pound in Alabama to $1.00 a pound in California,[8] and corn prices from 15 cents a bushel in Missouri to $1.25 a bushel in Rhode Island.[9]

The statistical work of the Department of Agriculture has had many opponents and many supporters; but Department officials have had faith in the value of this work. Speaking of the work of the Statistical Division of the Department, the Commissioner of Agriculture said in the 1881-82 report:

> It is a work demanded by the producer who would know where to find the best markets and highest prices; by the consumer who would see abundance at a cost within his means, and without extortionate exactions of the carrier and middleman; and by the legitimate dealer who seeks protection, as does the farmer, against the piratical course of the reckless speculator. It becomes a necessity—an imperative duty, when opportune falsehood is able in a single day to wrench millions from the grasp of producers—that the Government should forewarn and forearm the multitudes which represent its foundation industry. This protection the statistical division of the Department, properly equipped and administered, can effectually accord.[10]

The great increase in surplus production which had to be marketed in Europe made it necessary, in the opinion of the Commissioner of Agriculture, "to obtain prompt and trustworthy information of current crop reports of the world, and especially of European countries."[11]

The thought prevailed that statistics were to be of value to the farmer in marketing his products.

> A further important utility is found in agricultural statistics, through their elucidation of the relation of the supply of farm products to the demand for farm products in the markets of the United States and in the other markets of the world.[12]

In 1896 the Secretary of Agriculture called specific attention to the need of giving more attention to statistics and the marketing of farm products.

> Agricultural colleges and experiment stations are teaching the science of agriculture. But they are not generally teaching farm economics and the importance of markets. Science is constantly showing the farmer how to increase the annual product per acre in cereals and other staples, but the great question confronting each tiller of the soil is how to secure satisfactory remuneration for the results of his toil. In view of this, it is a legitimate function of the Department of Agriculture to place before the farmers of the United States as many facts and figures relative to markets as it is possible to obtain.[13]

In furtherance of this aim there followed a re-organization of the statistical work.

> As now organized, the Bureau of Statistics includes a Division of Domestic Crop Reports, a Division of Foreign Markets, and a Miscellaneous Division, which conducts special investigations and collects statistics on rural economics.[14]

By 1909 the work of this bureau had greatly expanded and covered a wide field of interests. Its principal lines of work included gathering, digesting and publication of statistical data in regard to crop conditions, crop and livestock production, imports and exports of agricultural products, "special studies and investigations of (a) agricultural production in the United States over long periods; (b) the foreign production of certain crops over long periods; (c) foreign markets for the agricultural surplus of the United States; (d) problems relating to the transportation of farm products within the United States and across the seas; and (e) various important phases of agricultural industry and rural life."[15]

Almost 40 years ago the Department gave serious attention to the statistics of price with the view of giving the farmer information to guide him in his production activities. The Bureau of Animal Industry made a study of hog prices and reported a "corn-hog ratio." "From the facts we may conclude that during the eighteen years covered by the tables and charts the following general rules appear to bear upon the quotation:

> 1. The price of hogs increases with the price of corn without regard to the amount of hog product placed upon the market.
>
> 2. After an advance in the prices of corn and hogs for a series of years the price of corn dropped one year before the decline came in the price of hogs.
>
> 3. The fluctuation in the quantity of hog product per capita of population which followed an advance or decline in the price corn after having moved in the opposite direction did not usually occur until a year had intervened. When corn had been high, this failure of the hog product to increase with the first decline in corn kept up the price of hogs or even increased it for one year after corn had dropped; but when corn had been low, the failure of the hog product to decrease in quantity the first year that corn advanced did not prevent the advance in the price of hogs immediately following the increase in the price of corn.
>
> It would appear that the above conclusions are worth remembering, for if these rules have held good for eighteen years they will likely apply for some time in the future.[16]

Whether these conclusions are sound or not is not pertinent to this discussion. The point to be made is that attention was given to these problems of corn and hog production and prices, and to the planning of production, and that the Department was studying such problems.

In making a summary of the study, the report said:

> It appears that the best returns for hogs in comparison with the price of corn were received during the intermediate years between the extremely high or extremely low prices. Taking the eight years 1873, 1876, 1877, 1879, 1880, 1883, 1884, and 1886, we find the average price of corn to have been 39 cents, and the average price of hogs $4.59. For these years it will be seen that 8.5 pounds of hogs brought as much as a bushel of corn.
>
> These facts are important as indicating the proper course for the farmer to pursue under the varying conditions which are here considered.[17]

In the nineties attention was given to the position of agriculture in relation to other industries. A study of farm prices from June, 1889, to September, 1891, was made by the Department, and in its report to the Senate Finance Committee the trends were shown by the use of "Price Relatives."[18] Purchasing power was calculated on an acre basis, in later studies, for different farm products in exchange for flour, muslin, coffee, sugar, and other products.[19]

> Taking into consideration the variation in the price of things which farmers buy and in the things which farmers sell, it appears that the purchasing power of 1 acre of crops in 1911 was 1.2 per cent less than in 1910, 5.7 per cent less than in 1909, and 41.6 per cent greater than 1899.[20]

Economics of Production

Not only was there a recognition of the importance of statistics to a well-regulated agriculture, but for years there has been an appreciation of what we now call the economics of production. Large crops were not the sole aim, for it was early recognized that "the chief object, of course, in raising any crop is profit."[21] "Let our motto be 'the greatest amount of produce at the least expense.' Profit is our object; and how shall we secure it except by cheapening the cost of production?"[22] It was realized that large crops alone do not make profit but sometimes bring a loss.

> Paradoxical as it may seem, it is nevertheless true, as stated by Chaptal, that a farmer may be ruined by a good harvest. When science therefore, suggests a lavish expenditure simply for the sake of insuring a large yield per acre, she does a positive injury.[23]

In order to bring success it was stated that "of all business men farmers should be the closest calculators of *profit* and *loss.*"[24] And in 1912 the Secretary of Agriculture was hopeful that "bookkeeping will soon be as common on the farm as in the factory. It is just as important for a farmer to know what it has cost to produce a given crop as for the manufacturer to know the cost of making the article he sells."[25]

In many of the farmers' bulletins references were made to the cost of production and profits. Attention was given to profit in the dairy industry, and emphasis was placed upon the importance of good cows. The farmer was urged to keep records "so as to know which of the cows are being kept at a good profit and which are only barely paying their keeping, and thus be able to weed out the unprofitable stock and improve the herd."[26] This statement shows that good cows were considered the basis of profitable dairying. This viewpoint is supported in numerous bulletins of the Department in the following years, and these publications no doubt laid the foundation for the cow-testing-association work which followed. Cost-of-production studies were made also from time to time in other lines of agriculture.

Profit being the object, good farm management practices must be followed. Efficient production has long been considered necessary. In the early forties representatives were sent to Europe to study agricultural methods and conditions. One of these representatives reports that "some of the works which treat of the science of apportionment are full, and furnish a vast fund of information relating to, the proportions to be maintained between different crops, the quantity of land, of seed, the number of laborers, the time to be employed, the expenses of cultivation, the number of stock to be kept, the quantity of manure to be made, and how this is to be procured, the amount of crops, time consumed, and force to be employed in gathering them, etc., and indeed every particular embraced in the operations of farming-husbandry."[27] We have in this early statement evidence of an understanding of the problems of farm management which some moderns think was not present until recent times.

Reference to farm management in the early reports are rather few. In the report for 1867 there appears a review of the proceedings of the annual meeting of the Maine Board of Agriculture for the year 1866 in which there was included a report of the Committee on Farm Management. The points covered in the report of this committee included the size of the farm, the exhausting qualities of the oat crop, effective measures to increase the hay crop, should more beans and peas be grown, the efficiency of the ox-yoke, the winter care of farm stock, shall small fruits and vegetables be cultivated more extensively, and the use of improved implements.[28] In a few of the Commissioner's reports during the years following there were references to the problems of farm management.

It was not until 1902, however, that the farm management work of the Department was really established.

> As the work of re-organizing this Bureau [Plant Industry] developed, the need was felt for properly co-ordinating all the varied lines of plant work in such a way that they could be brought directly home to the practical farmer and fruit grower in all parts of the country. To this end I have approved the establishment within the Bureau of an Office of Farm Management, which shall have for its object the bringing together in concrete form all the facts developed in the Bureau as a whole, sifting the results, and applying them in a practical way where they will do the most good. To enhance the value of this work, general studies have been inaugurated in the matter of securing facts, regarding the way in which the best-paying farms in the country are being managed, and what are the relationships of surrounding conditions, such as proximity to markets, ways of leasing or controlling the lands, soils, and climate, and the methods of farming followed. With the knowledge thus secured, it will be practicable to lay out a working plan for a particular farm in a particular region, the object being in all cases to have such plans serve as object lessons for type regions rather than for individuals. In line with this plan there is now being undertaken in different parts of the South demonstration experiments for the purpose of showing the possibilities of more diversified farming.
>
> With the co-operation of farmers, working plans are being devised whereby the present system of growing only one crop will be changed so as to secure more diversification, thus insuring greater profits, and to building up of the fertility of the land.[29]

The above statement of the Secretary sets forth the aims and purposes of the Department in the development of farm management work. It will be noted that farm management was to be restricted to the field of the Bureau

of Plant Industry, and it was not until 1915 that a separate office was established to deal with farm management in all phases of agriculture.

Some farm management work had been done, however, by the Division of Statistics.

> In co-operation with the State Agricultural College of Minnesota a statistical investigation is being conducted by the Division of Statistics into the methods of farming, the results of which will have an important bearing on such questions as the relative profitableness of crops, the economical utilization of farm labor, etc.[30]

The study of types of farming[31] continued, and many articles appeared in the yearbooks by the workers in this division. After a few years, new lines of investigation were taken up, such as seasonal distribution of labor on the farm,[32] studies in farm practice, farm equipment,[33] farm bookkeeping and cost accounting, and farm management surveys, to determine what returns are being received for capital and labor on the average farm of each type.[34]

Farm labor and wages were studied by the Bureau of Statistics, and a report by George K. Holmes appeared in the 1910 Yearbook.[35] This study dealt with the number of persons engaged in agriculture, population movement from the farm, effect of machinery on labor productivity, labor of women, wages, relation between production and wage rates, and the problem of holding the country population on the land.

Cost accounting and the recording of income and expenses have for a long time been considered important to a successful agriculture. The early agricultural reports contained reports of costs of production and profits from agricultural operations.[36] In 1848 it was reported that the cost of raising wheat was $9.40 an acre, and resulted in a profit of $4.10.[37] The cost of producing an acre of corn was $32.00, and the profit was $11.50.[38] Cost of production studies by departmental workers were not made until the early years of the present century, the earlier figures published being those supplied by correspondents. It was recognized that it was very difficult to secure accurate costs.

> It is not practicable to obtain the exact cost of production, for the reason that few cultivators keep systematic systems of accounts. It is perhaps easier

to approximate the real cost of cotton than of other products of agriculture; being a prominent specialty, sometimes monopolizing the resources of cultivation, it is less complicated than mixed farming.[39]

Early in the present century, cost of production studies were started by the Department.

In co-operation with the State Agricultural College of Minnesota, an investigation is being conducted by the Division of Statistics to determine the cost of production per acre of the principal crops.[40]

Some of the results of these studies were reported in 1911.

The results of the investigation upon the cost of producing corn, wheat, and oats, published in several numbers of the Crop Reporter, made it evident that the cost of producing crops varies widely in different sections of the country. The average cost per bushel of producing corn was found to be 37.9 cents (including rental charges), varying by States from 30 cents in Iowa and South Dakota to 72 cents in Maine; the average cost of producing wheat was 66 cents per bushel (including rental charges), varying by States from 44 cents in Montana to 96 cents in South Carolina; and the average cost of producing oats was 31 cents per bushel (including rental), varying by States from 23 cents in Montana to 56 cents in Connecticut. It is proposed to continue this line of investigation.[41]

Studies were made also of the cost of farmers' supplies, and in 1910 it was discovered that the costs of these supplies were rising and the purchasing power of agricultural products decreasing, even though it was 44 per cent higher than at the beginning of the century.[42]

Marketing

The first Government publication which I have been able to discover dealing extensively with the general subject of marketing is Farmers' Bulletin No. 62 (1897), entitled "Marketing Farm Products." In this bulletin attention was given to packing, preparation for market, the functions of the commission merchant, and the special instructions for the handling and marketing of different fruits, vegetables, meats, and eggs.

In the agricultural literature of the Government we can find practically every phase of the marketing treated prior to the year 1913. There has probably been more written on the question of preparation for market and the importance of quality products than on the other phases of the whole

problem. This emphasis on quality dates back to our early history. In speaking of the import of pork into England, one of the English importers said:

> The imports of this article from the United States this year . . . . have been small . . . .; but little of which has been well adapted in its cut and cure for this market and, consequently, has had to be sold at prices much less than my quotations, and at a great sacrifice to shippers.[43]

Shippers were urged to take more care in the matter of selection and preparation of pork for the English market, and were told that the shipment of an inferior product would be sure to result in a loss to the owner.[44] An English correspondent, quoted in the Agricultural Report of 1845, said that "in curing, cutting, and packing there is still something to learn. Neatness, cleanliness, and sightliness are continually requisite, as well as an adaptation as closely as possible to the uses and customs of our markets."[45]

In the same report it was stated that "the same fault, though in a less degree, of irregularity in packing has been found with American wool . . . ."[46]

In those days, as now, products of superior quality brought the best prices and were in demand in the English market.

> The best brands continue to give satisfaction and to bring prices highly remunerative, being generally preferred to Irish (beef), while secondary and inferior brands are much more difficult of sale, even at a wide difference of price.[47]

Many more instances of this kind may be cited to show that the importance of proper quality and the right kind of packing; but one more must suffice. In speaking of the imports of American bacon, one English importer said:

> A considerable portion of which was soft, oily, inferior quality; and to this circumstance more than to the great quantity, the serious declension in prices and consequent heavy losses to shippers are attributable.[48]

That the efforts in the matter of improving the quality of our exports were fruitful is attested by an English merchant who, in writing to the American Agriculturist, said:

> The early attention you asked of your readers to the English mode of putting up provisions begins already to manifest itself in the very improved manner in which they are now brought to this market and the improved prices they command.[49]

In some lines of agriculture very little can be done to improve the quality of production. This is not true, however, in the case of butter. Good quality butter can result only from extreme care throughout the productive process. That the butter which we exported to England a number of years ago was not of the desired quality is evidenced by the statement:

> The American butter is a poor article generally there, and does not find purchasers for table use, but is used to grease machinery in the manufacturing district.[50]

Quality was recognized as important to prices, and the poor quality of a part of the butter was considered to ruin the reputation of all American butter. The Commissioner of Patents in his report of 1849 said:

> Probably more than half the butter sent to England from this country is sold as *grease* and at half the market price of a good article. This injures the reputation of all American butter, and diminishes the demand for it abroad.[51]

The shipper was advised that it was inexpedient to send inferior butter to foreign markets as "loss to the shipper is invariably the result."[52]

It was early recognized that a good quality dairy product would not result unless good milk was furnished the manufacturer.

> It will be seen that cleanliness in every process connected with the management of milk and its products is of the first importance, and that, without it, neither cheese nor butter-making can be carried on so as to produce an article that will give satisfaction either to the dairy factor or consumer.[53]

The dairy industry made great strides in the years immediately following the Civil War, and one of the most important factors of the business which was considered important was the improvement of quality. "Why is it that when superior butter brings twice the price of poor there is so much that is decidely unfit to eat?"[54]

> The finest opening for profit in the conversion of milk is found in the manufacture of a superior quality of butter, like the "Philadelphia Print," which will bring 75 cents to a dollar per pound when furnished in all its freshness and purity to appreciating customers, able to pay for it, while the fair article of tub butter is selling at 35 to 50 cents.[55]

Not only must the production be of good quality, but it must be packed in the proper way to preserve that quality and suit the preferences of the market.[56]

> In the general market, constantly varying character of packages of dairy-produce received from any given region must necessarily work injury to the producers of that region, taken in mass, skilled and careful makers suffering to a greater or less extent to the shortcomings of the carelessness of the unskilled.[57]

During this period the Department of Agriculture did very little because of lack of funds and trained men to teach farmers how to produce better products. They were merely advised of the importance of quality. Early in the present century the Department established the market inspection of butter at Chicago and New York with the view of assisting creameries to improve the quality of their product and "if the butter is not of good quality they state what the defects are and make suggestions for overcoming the trouble. This work has resulted in a general improvement in the quality of the butter received on the market, and has thus enabled the creameries to obtain better prices."[58]

It was soon discovered by the workers in this field that poor-quality butter was due to the fact that the cream was not good. As a result of this the Department endeavored to encourage improvement in the quality of creamery butter by inducing the creameries to discriminate against bad cream, and by encouraging farmers to send their cream in a fresh and wholesome state. It was "found that good cream naturally produces a higher grade of butter, which commands a better price on the market, so that good cream should yield the farmers a better price."[59] This work was no doubt the foundation of the better quality butter which has been coming to market in the more recent years.

Standardization. One of the most important types of work which has been developed by the Department of Agriculture has been that of standardization. This work started, quite naturally, with the grains and cotton rather than with perishable products, which were more difficult to standardize. The work in grain standardization appears to be the result of demands made upon the Department, and the adoption of official grades was preceded by several years of

investigation pertaining to almost every phase of grain production, harvesting, handling, transporting, storing, and the grading of grain.[60] The official grades for grain finally promulgated by the Department of Agriculture were based upon the results of this investigation.

Inspection. Market inspection, which is now one of the many activities of the Bureau, was started about 20 years ago in the butter market with the object of improving the quality of butter. There was no inspection, so far as I have been able to discover, such as is now conducted at terminal markets and shipping points in connection with the settling of disputes between shippers and receivers. The market inspection of these early days should be considered more as a part of the quality improvement work.

Demand Studies. A study of consumer demand is considered essential to good marketing, and the Department of Agriculture has, in the past few years, been making a number of these studies. The thought back of such projects is that production should be guided in accordance with the demand of the market, and that more profit will result when it is so guided. With the increase in commercial agriculture, more attention is given to the market, but we find that before the close of the Civil War a study of consumer demand was attempted by the Department. This was in relation to the wool market, and the Commissioner of Agriculture said:

> With the view of obtaining more definite information on the subject, and with the hope of inducing our farmers to engage more largely in wool-growing, and by producing the qualities most desired by the manufacturers, to check importation, I have addressed circulars to all the woolen manufacturers in the country, asking the quality and quantity consumed by each, and the kind that it is deemed most desirable to increase.[61]

After the depression of the nineties there was renewed interest in the foreign market, and the Foreign Market Section of the Division of Statistics was established to deal with these problems. Attention was given to the problem of demand, and the Chief of this section recognized that a knowledge of the tastes and customs of foreign consumers was essential to our success in competing with other nations for world markets.

> In this contest for trade, the first requisite is a thorough knowledge of the conditions to be met. To assist in supplying such a knowledge is the object of the Section of Foreign Markets.[62]

The concept that there must be a knowledge of markets and production guided to meet these market demands dates farther back when most of us have any idea. When the agricultural work of the Government was being developed it was suggested that there be an appropriation made "to allow a personal examination of the various parts of the country by someone well qualified for such a duty,"[63] to secure information about markets and market conditions. This "would, it is believed, realize a vast amount of practical good, especially to the South and West, by furnishing the data on which they might direct their products to the best markets for domestic sale or foreign export."[63]

Producing to Meet Demand. Market information service seeks to direct the product to the best possible market. There was, however, recognition of the fact that the right things must be produced.

> Planters and farmers should regard the commercial world as members of one family, to avoid the errors of producing too much of some necessaries and too little of others,"[64] and "the kind of crop most profitable for cultivation in any section of the country must depend not only on the soil and climate but the convenience of conveying the same to market."[65]

The first Commissioner of Agriculture considered it the special duty of the Department "to place before the farmer all the elements of demand for the products of his labor that he may give it such direction as these elements point to."[66] In the eighties wheat prices were low, and it was the official opinion of the Department that the over-production and low prices "point to the sharp necessity of adapting production to consumption, to supply food production now imported, to give remunerative employment to agricultural labor and food in variety, and cheapness to consumers."[67] Farmers of the United States were advised that they must study and cater to foreign demands if they proposed to hold their share of foreign markets.[68] Two years later the Secretary considered that it was the duty of the Department to carry information to the home of every farmer in order that he might be able to direct his efforts in accordance with the changing conditions of the demand.

There were many other references in the Department of Agriculture publications to the problem of producing to meet the demands of the market. One of the best of these articles was prepared by Mr. George K. Holmes for the 1904 Yearbook. Mr. Holmes said that "farmers should learn the whims and fancies of the markets that they reach, or can reach, and endeavor to meet those fancies. By so doing the highest prices and the largest profits may be obtained."[69]

That the farmers' troubles were not all due to conditions and actions of others was asserted in 1908 by the Bureau of Plant Industry.

It should be clearly understood that not all of the trouble and dishonesty in the marketing of crops is to be attributed to the transportation companies and middlemen. The average farmer does not pay enough attention to market demands and requirements. If he allows weeds to grow in his hay and grain fields, he will take weedy hay to the market and his grain will be full of weed seeds. The prices will be cut accordingly, sometimes excessively. If he does not produce the right varieties of fruits and vegetables and send them to market properly and honestly packed according to his market requirements, he cannot expect the best prices.[70]

Development of Markets. The surplus of agricultural products has always been one of the problems since farmers produced for market. Demand may be known, but the supply be more than sufficient to meet that demand. There are two ways in which this problem may be met. One is by decreasing production, the other by developing markets. Before the Mexican War and the great addition to the cotton-producing section in the Southwest, the cotton planter turned his attention to the developmnt of markets for his products. It was considered that the remedy for a low price was the stimulation of demand.

As cotton is now so low, and so little in demand in the foreign market, unless a market be created at home it must necessarily become an object of less attention to planters.[71]

This early period was a time when a greater home market was much desired.

The question how shall our surplus products be disposed of is one of deep interest to the people of the whole country. A home market, it must be admitted, is the most sure and important.[72]

In order to develop the home market it was considered that this country was "driven to the necessity of so far upholding our own manufactures and creating a greatly increased consumption,"[73] "or seek a foreign one with all its fluctuations."[74]

During the period from the middle forties to the seventies there are very few references in official agricultural literature to the problem of developing markets. There were references, however, to this problem in 1873.

> Leading dairymen hold forth another inducement for securing all attainable means for improvement of cheese manufacture, the hope of developing that immense home field in which demand is now relatively inactive.[75]

In the nineties the problem of the surplus and the need for expanding markets was definitely considered, and there is evidence that some action was taken concerning this.

> During the year the labor of finding where the greatest demand for the surplus farm products of the United States has developed outside of their limits has been persistently and intelligently alert and active.
>
> There is nothing of greater or more vital importance to the farmers of the United States than the widening of the markets for their products.[76]
>
> The rapid development of the agricultural resources of the United States has resulted in an annual production far in excess of the consuming capacity of our population. To such a degree has the surplus increased that its disposal is fast becoming a grave problem. The logical solution lies in the extension of our markets beyond the sea. To accomplish this in the face of the keen competition that other great producing countries are prepared to offer, an accurate and thorough knowledge of conditions to be met is essential. The investigation of these conditions and the diffusion of the information thus acquired comprise the work for which the Section of Foreign Markets was created.[77]

After the return of prosperity following the depression of the nineties, the Department of Agriculture turned its attention to developing markets for special products, particularly fruits. Experimental shipments were made to European countries in an attempt to discover the type of product which would sell best in those markets, and thus discover the best methods of handling and shipping these products to foreign markets.[78]

Cold Storage Investigations. The growth of the commercial fruit business in the early years of the century, and the development of the cold storage warehouse industry, brought the problem of storage to the attention of the De-

partment of Agriculture. The influence of cold storage on market is referred to in 1903.

> The cold-storage warehouse industry in its broadest economic relation is equalizing the distribution of the apple crop throughout the season, and equalizing the price as well. Like other warehouse systems, it must ultimately add greater stability to the supply and demand and materially benefit the producer and the consumer. The producer will reap the benefit of a steadier condition in the apple trade, and of more uniform prices. The consumer will realize the advantages of a more uniform supply of apples throughout the year at even prices.[79]

The rapid development of the cold storage business caused the Department of Agriculture to make an investigation of this business. This study covered such problems as length of time in storage, dates products were put in and taken out, cost of storage, effects of storage on prices, and cold storage as an aid to speculation.[80] This study was also carried on during the next year. All previous studies of cold storage were from the standpoint of pure food and health. This one, reported in 1911, was the first which dealt with the economic phases.

Transportation. There are quite a number of references to the problem of transportation. The only reported study made of this problem appears in the 1906 Yearbook. In this investigation a study was made of hauling from the farm to the local market, and covers the cotton and wheat transportation problems.[81]

Cost of Marketing. When attention was turned to the market problem, about the close of the first decade of this century, much thought was given to the problem of market costs and the spread between the price received by the producer and that paid by the consumer. The remedy commonly given for the market problems at that time was the shortening of the route from the producer to consumer. This same remedy was considered important in the cotton market more than 60 years prior.

> Every mile by which this route can be shortened, every obstacle which can be removed or avoided, every cent of expense which can be saved are advantages, the benefits of which will be shared by the two individuals who stand at the extremes of this line of transit, and will cause not only an augmentation in the price of the raw material, but will create a large consumption, and thus call for a larger supply of the commodity.[82]

In the agricultural literature during the later sixties and seventies there were many references to the great spread between producer and consumer prices, and this was considered the main reason for the unprofitableness of agriculture. It was recognized that the middlemen were necessary.

> But the number and profits of middlemen are disproportionately large, and as they contribute nothing to production, and are burdens on the producing classes, it seems to be the interest of the general public that they be reduced as much as practicable.[83]

This problem appeared again in the nineties, and the Secretary of Agriculture considered it the duty of the Department to give this their study. In the Agriculture Report of 1891 the Secretary said:

> In considering the wants of our farmers in relation to the home market, the opportunities for extending observation in relation to prices of agricultural products which the duties of my present position afford me have confirmed me in the strongest manner in my previously-formed impressions in regard to the excessive difference between the prices paid for agricultural products in the market by the consumer and those paid on the farm to the producer. This is a serious evil, enhancing the cost of living to our people, while it depreciates the value of our crops to the farmers. A large share of this difference in price is to be attributed to the handling of the product from the time it leaves the farm until it is delivered to the consumer. The condition of our farmers living in the country away from a market center, and obliged often to spend an entire day to deliver one load of produce at the nearest market or station, and the general tendency of our people to transact business in the quickest way possible, gives to the middleman a prominence and an influence greater than he probably possesses in any other country.
>
> To provide an adequate remedy for this evil is not an easy task, but there is one thing which can be done for the benefit of both producer and consumer, and this duty clearly devolves upon this Department. It is to keep the public thoroughly informed on the matter of prices of all important farm products. Doing business daily at a market center, the middleman knows what prices he can obtain, and his rule in purchasing . . . . to get the goods he deals in as much below that price as possible . . . . is greatly subserved when he deals with a seller ignorant of the true value of his goods. My earnest efforts have been directed to placing promptly in the farmer's hands the fullest information in regard to the market values of his wares, which will at least save him from the penalty of ignorance and the unscrupulous greed of traders. To extend this work until every farmer in the country may know before he markets his goods just what their value is in the nearest market is my earnest desire and intention.[84]

The increasing cost of living and the decreaisng profits of the farmer just at the close of the first decade of the

century revived interest in the problem of market cost. It was thought that "every possible saving must be accomplished in the cost of production and marketing. Consequently the farmers are organizing their own cooperative warehouses, elevator systems, and trading facilities, and demanding legislation to control railroad rates, grading, weighing, etc. It is necessary that every farmer and consumer should take an active and careful interest in these matters that so greatly affect the profits of labor and the cost of living. There is no good reason why the necessities of life and even its luxuries cannot be supplied at less than the present cost by improved methods of production and by cutting out all unnecessary wastes."[85]

It was about this time that the Department of Agriculture started market studies to determine the cost of marketing and the methods followed. In the 1909 Yearbook there appeared an article on the methods and costs of marketing which dealt with the problems of finding a market, diversion of shipments, market places, classes of middlemen, and spreads. Later studies were made on the cost of marketing and transporting grain and livestock, and how market wastes could be reduced.

In 1911 the Secretary of Agriculture asked a question which became, in substance, quite common. "The consumer pays a dollar for food; the farmer gets less than 50 cents for it. Who gets the rest?"[86]

Market Systems. When interest developed in the cost of marketing, attention was given to the various systems of marketing farm products. In the report of 1861 there appears a rather complete description of the milk market of New York City and Washington. In this report one finds a statement of the rail receipts of milk of New York City, how the milk is handled, the extent of the producing area, an estimate of the milk consumption per capita, and prevailing prices. Nine years later there appeared descriptions of the milk markets in St. Louis and other Southern cities. Attention was given especially to the problems of prices, places of production, and the purity of the milk supply.

In 1908 the work of the Bureau of Statistics was re-or-

ganized so that more complete studies could be made of economic problems of agriculure, especially those of the market.[87]

Cooperation. Cooperation has been considered by many, within the past decade, as the solution of the farmers' problems, and it developed very rapidly during this period; but we can find instances of this type of marketing at different times during the history of this country. The first great movement in this field was in the later forties when the Wood Depots were organized. This movement had back of it the same fundamentals that were back of the more recent developments.

After the Wool Depot development there were no official references to cooperation until the later sixties, when the Associated Dairy System grew up. This system came into operation more because of the advantage of factory buttermaking than those of cooperative selling. Marketing advantages were claimed, however, for this system.

About the same time the Associated Dairy System developed there were other cooperative movements. The activities of the Grange were a part of this movement, and did much to encourage cooperation. In the later sixties there was a Milk Producers' Association in the Boston market area.[88] The New York Dairymen's Association was active in the early seventies, and aimed to improve the system of marketing as well as productive practices.[89] There were also associations for shipping livestock and grain.[90]

Cooperation, of course, had developed to a considerable extent prior to 1910, and the Department of Agriculture endorsed this movement, claiming that it effected great saving and tended to improve the quality of the products,[91] and that "one of the most promising tendencies of to-day is the spirit of cooperation and mutual helpfulness which is beginning to manifest itself among the producers of truck crops. The successful organization and working of cooperative marketing companies or exchanges by farmers have proved the possibility as well as the desirability of a system of marketing which shall have headquarters at the point of production."[92]

A discussion of cooperation in the handling and market-

ing of fruits by G. Harold Powell appeared in the Yearbook for 1910, and was the most complete discussion of this problem up to that time. It appears that by 1910 the Department of Agriculture was definitely committed to a policy of aiding cooperation.

Prices and Price Control

Prices and price control have long been the subject of much interest to the farmers of this country. The belief has been held from time to time that prices could be controlled by holding products off the market. Prices for agricultural products may go low, "but it ought not to be forgotten that the planter may keep back his supply."[93] "If cotton cannot be grown to pay at the present rates, it is assuredly certain that it will not be raised; and, in spite of every argument to the contrary, it is hardly possible to suppose that, at five cents (which, according to the existing quotations, will be the price of the average of the crop), planters will be induced either to grow or to sell."[93]

During the depression of the nineties there was an attempt to hold wheat for a higher price. The results of that attempt were commented upon by the statistician of the Department of Agriculture in the report for 1892:

> In connection with this question of surplus comes the necessity of regarding the statistical position of wheat . . . . the production and stocks of the world. The idea has been inculcated of late, in behalf of wheat-growers, that prices can be put up by the fiat of imperious will, in defiance of the law of supply and demand; and hence arose an organized effort last year, in the face of the largest product ever grown in any country, to delay distribution under the advice "hold your wheat." It was believed by some that it might be possible by such means to force prices to $2.00 per bushel. It was believed by many, who paid for their credulity in heavy losses. Wheat was held back, and from the nooks and corners of the earth, including the remnants of reserves in unheard-of places, came forth grain to supply the assumed deficiency, which was really a surplus, as the loss in Europe was more than made good by the gain in America. Some of these advisers attested their honesty and atoned for their miscalculation by suffering with other producers. This office gave the necessary information, which was disregarded, while distribution was checked until supplies from other sources began to reduce prices; and then came a rush to unload farmers' reserves, elevators were crammed and wheat trains side-tracked, depressing prices still further, until the lowest rates ever known were quoted at Liverpool, and still lower prices in vogue here.

The disastrous result extended into the present year, the surplus helping to swell the crop of 1892 and make visible stocks larger than ever before.

The fatal error of suppressing crop statistics, or manipulating or misinterpreting them as a price tonic, has had an expensive object lesson. The farmers can only deceive themselves by attempting to deceive the commercial world in the matter of crop production. They need to know the truth, and cannot be harmed by its proclamation, but usually will be by its suppression.[94]

Again, in 1912, the question of holding products off the market was officially commented upon:

Holding merely for the purpose of raising the price when the prevailing price is fair, and when the supply is ample and equal to the demand, is bad economics and probably wholly indefensible. Any widespread movement to bring about excessively high or fixed prices will certainly result in the stimulation of cotton culture in foreign countries and the ultimate restriction of the market for American cotton.[95]

There seem to be no indications that the Department of Agriculture ever officially approved holding products off the market in order to keep up the prices, but "orderly marketing" has been considered good business.

Something should be done by the cheese-makers and shippers in the way of regulating exportations. If we could give England a steady supply, without pushing forward an immense quantity to clog the market, prices would be maintained, and greater profits realized.[96]

One of the advantages claimed for cooperation was that it enabled the producer to store products so that they may be distributed "throughout the consuming period in such a way as to meet the requirements of the market without overloading it and depressing prices."[97]

In order for producers to market their products in accordance with the demands of the market, and have information upon which to base marketing policies, the Bureau of Statistics shortly after the end of the last century began to gather information concerning stocks in hands of growers and in hands of dealers, monthly marketings, and market prices.[98]

Price Forecasting. The recent work in price forecasting by the Bureau of Agricultural Economics, and the criticism which this work has received in some quarters, leads one to inquire just when this forecasting business was started.

In going through the old Agriculture Reports I find that a forecast on the price of cotton appeared in 1843.

The prospect now seems to be that the price of this article will rise, though the use of it will diminish, after it reaches a certain maximum.[99]

No evidence was found of this stirring up the ire of Southern Congressmen. This might have been due, of course, to the fact that a rise rather than a decline in price was forecasted. During the following year another forecast was made relative to the price of this product. After reviewing the probable crop and demand and the "remote possibility of war," the forecaster said:

But the transactions of this year, as far as regards speculators, have been so unfortunate that it is probable the market will be left very much to the trade for some time to come, and under these circumstances it is rare for prices to improve either very rapidly or considerably. Decline seems considered by everyone to be out of the question; but whether or not any material advance is to be experienced depends so much upon points that are yet doubtful that to predict an important rise, should it prove to be the case, would be rather a fortunate conjecture than the result of reasoning which at present could be justified.[100]

This statement is surely one of a cautious forecaster. But not so hesitant was another gentleman, quoted in the 1848 report, who believed in his statistics and ventured a forecast as to the trend of hog prices.

I have no pecuniary interest in the subject, as is well known, but am under the strongest possible motives, as a dealer in statistics, to spare no pains to ascertain the truth, and to state it correctly. I confidently predict a heavy rise from present prices before the season is through, and am willing to risk my reputation for judgment on that result.[101]

In the same report there was a forecast on the price of wheat.

In view of so many circumstances which now combine to disturb ordinary calculations, we cannot speak with much confidence as to the immediate future of prices; but looking at the enormous import of grain during the last four months, the comparatively small stocks now on hand, the increasing activity in the manufacturing districts, and the general employment of the population in profitable labor, together with the fact that no early arrivals can take place for the ensuing three months, there seems a strong probability that prices will advance rather than recede from the present level.[102]

In the Agriculture Report for 1850 there appears an article on the cotton trade by Professor C. F. M'Kay of the University of Georgia in which the following cotton forecast was made:

As the stocks are now much lower than last year, and as they were then very low, they will bear no further reduction without a material advance in prices. On the contrary, any decline in price would immediately permit the consumption to expand, not only in France and the rest of the Continent, but even in England. We may expect, therefore, that the present high range of prices will be maintained.

The review that has been taken of the supply and the demand shows that the present advance in cotton is the result of no speculative movement, but that it is based on the immutable laws of trade. The long prevalence of low prices has stimulated consumption and diminished production until the stocks on hand have fallen to an extremely low limit. Exactly at this point, an unfavorable season has lessened the crop, and an abundant harvest and every other element of general prosperity have encouraged demand.[103]

Two years later a report on the cotton trade by Professor M'Kay was published. This article is not a superficial statement, but shows that much thought and study of statistics were given to its preparation. An analysis was made of the price situation, which is summed up as follows:

The whole demand for 1853 will then be estimated at 3,625,000 bales, which is 75,000 more than the anticipated supply. Now, as the stocks on hand are at present very low, lower than they have been for years past, especially if the time for which they would supply the demand be considered, it would seem that prices must keep above their usual average. This has been 8½ cents at the seaports for the last thirteen years; and if the influence of a high rate of exchange and the abundance of gold are to be regarded as real causes for elevating the money value of cotton in our markets, it would seem probable that the present prices (9½ cents at Charleston, October 29, for good middling) will be fully maintained, and that an advance rather than a decline may be expected.[104]

Agricultural price forecasting seems to have gone out of style for a while, as the next forecast does not appear until 1889. In that year the Bureau of Animal Industry discussed the factors influencing the prices of the cattle and hogs and ventured a forecast on the price trends.

The tendency of prices with cattle will probably be to advance within the next year or two on account of the improbability of increasing the stock of cattle as rapidly as the population is augmenting, but this advance will be slow and uncertain for a number of years.[105]

Governmment Guarantee of Prices. It would have been unusual if there had been no demand for the Government to guarantee prices of agricultural products during periods of depression. Twice during the depression of the nineties the Secretary of Agriculture spoke relative to the possibility

of a Government guarantee of prices. The first time, in 1890, he said:

If wheat growers should insist on growing 600,000,000 bushels, and at the same time demand a dollar per bushel, under existing conditions elsewhere, no exercise of power by the Government could possibly guarantee such a market price, or prevent its reaching a lower depth than it has hitherto reached.[106]

Again, in 1896, a more definite official opinion appeared.

Legislation can neither plow nor plant. The intelligent, practical and successful farmer needs no aid from the Government. The ignorant, impractical, and indolent farmer deserves none. It is not the business of the Government to legislate in behalf of any class of citizens because they are engaged in any specific calling, no matter how essential the calling may be to the needs and comforts of civilization. Lawmakers cannot erase natural laws nor restrict or efface the operation of economic laws. It is a beneficent arrangement of the order of things and the conditions of human life that legislators are not permitted to repeal, amend, or revise the laws of production and distribution.[107]

Marketing Investigations

Fruit. One of the first kinds of market work which the Government did was that of investigating fruit marketing. This work was started about the beginning of the century by making experimental fruit shipments abroad. It was believed that the Government could do much by carrying on such experiments to determine the kinds of fruits which would sell best in the fruit markets, and discover better methods of handling and packing.

In order to open up additional markets for our fruit and to bring about better methods of harvesting, packing, storing, and shipping the same, a small fund was secured for the present fiscal year, and the results accomplished with this encourage the belief that there are great possibilities for trade in American fruit abroad. Trial shipments of pears, peaches, and other fruits have been inaugurated with such encouraging results that it is believed the work will be undertaken next year on a commercial scale by private interests. With the unrivaled facilities America possesses for growing the finest fruits, and with a clear understanding as to the proper methods of handling, there is no reason why a fine foreign trade should not be developed.[108]

In speaking of the problems connected with getting the product from the orchard to the consumer, the Secretary of Agriculture said:

Some of the questions involved are with regard to the best methods of harvesting, grading, packing, and transporting each fruit, with reference to

accomplishing its safe and economical delivery at its desired destination; also with regard to the suitability of the variety, packing, and package to the needs of the consumers, who are to be the purchasers if profitable trade is to be built up. These questions are of especial importance in connection with the export trade, and a series of experimental shipments is being made to obtain light upon these points.[109]

The Bureau of Plant Industry spent much time in investigating the marketing of fruit. They early recognized this was a problem of physical handling as well as one of valuation, and they studied the problem from these two angles. One of the ways in which the glutted fruit markets could be remedied would be by increasing the facilities for handling and getting wider distribution of the fruit.

The avoidance of gluts is, therefore, of very great importance to the entire fruit industry. While many remedies have been suggested, that which appears most practicable and reasonable is the wider distribution of the products. For this reason, the chief line of investigation in fruit marketing has been the determination of methods best adapted to the harvesting, packing, storing, and forwarding of fruits to points relatively distant from their places of production, with a view to developing wider demand for them, both in the United States and in foreign countries. Chief attention has been thus far given to problems connected with the development of the trans-Atlantic export trade, the most important work having been done with summer and winter apples, peaches, and pears.[110]

This fruit marketing investigation work involved a study of methods of handling and storing on the farm so that it might be determined what influence these practices had on the keeping qualities of fruit during the marketing process. Studies of the problems of transportation, refrigeration, and cold storage were conducted also. The fruit transportation and storage investigations were rather extensive.

These investigations have related primarily to the handling of table grapes, lemons, and apples in California, oranges in Florida, and peaches in Georgia, the object being to ascertain the causes of loss through decay of fruit in transit; to determine methods of handling it which will reduce the loss to a minimum; and to secure information relative to the proper methods of caring for it prior to and during storage. In the transportation work in California and Florida, the behavior in transit of grapes, lemons, and oranges handled under the prevailing commercial conditions was contrasted with fruit so carefully handled that injury to individual fruits was reduced to a minimum. The results in practically every case emphasized the fact that loss in general is proportionate to the amount of injury that the fruit received prior to or during packing.

The special peach problem considered in Georgia was the influence during and after transit of cooling the fruit to a relatively low temperature before shipping. Rather marked results favoring such treatment were obtained.

In connection with the transportation tests made under different conditions, a large number of supplementary experiments, including the effect of washing lemons, were conducted in various packing houses.[111]

These fruit marketing investigations resulted in bringing together a body of fundamental facts concerning the marketing of fruit, and were the means of training men in this market field. This information and these men were the basis of the later work in the Bureau of Markets and Bureau of Agricultural Economics.

Cotton. Cotton market investigation work was started about 1910, and consisted of studying the types of cotton, methods of handling, middleman's profits, demands of the spinners, cooperative efforts in marketing cotton, and the steps necessary to take the product from the farm to the spinner. This work was, of course, basic to the development of cotton grades and standards.

Poultry and Eggs. "Work for improvement in the methods of handling eggs has been undertaken, and while it has not progressed very far it is certain that better methods will bring about a great reduction in the heavy losses experienced in the egg trade."[112] All during this early period in market work, emphasis was placed on the importance of proper handling of products.

The source of production. There is the starting point for most of the trouble in the handling of perishable produce, be it Southern cotton mishandled in the field before it is baled, or Western corn that is not well dried before it goes to the elevator, or eggs that are heated or soiled or cracked on the farm. Not all the trouble is at the starting place, of course. Good handling must be everywhere from the producer to the consumer if the maximum of quality and the minimum of loss is to be maintained. But even perfection of handling at the mbarket center cannot compensate for bad treatment at the source of supply. The wholesaler is being driven to good equipment and methods because it is economy; the retailer is being forced, little by little, to tell the truth because the strong-arm of education and the long arm of law are both after him. But the farmer, the country merchant, and the small packer are sadly in need of precept and example for the sake of both the producer and the consumer.[113]

Egg marketing investigations were conducted primarily by the Bureau of Chemistry, and involved experiments in

pre-cooling, refrigeration during transportation, packing methods, candling, and productive practices.

Meat. An investigation in relation to the meat supply and surplus of the United States was made

to determine, among other things, the meat production of this country and the per capita consumption, the importance of the meat industry as indicated by the capital directly concerned, the disposal of the national surplus of meat among importing countries during a long period of years, the stock of meat animals at census dates beginning with 1840, and the declining per capita consumption of meat.

In this investigation attention was given to meat consumption by workingmen's families, as determined by the Bureau of Labor; to the prices of meat and the consumer's cost of the meat consumed annually. Much information was presented concerning the quantity of meat consumed in foreign countries. An especially full statement was prepared for Germany, made possible by the meat inspection law of 1904.[114]

This study of meat supply and the market was followed by the cost and methods of transporting meat animals, conditions affecting the meat supply, and price movements.

Dairy Products. Investigation in dairy marketing were of two types. First, those which pertained to the conditions of supply and demand in domestic and foreign markets: fluid milk market practices; substitutes for dairy products; dairy cattle investigation and studies; marketing practices; and the factors which influence the quality of butter. Second, "the economic features of the creamery business."[115] In this study, "reports were solicited from creameries with a view to giving them assistance in their methods of conducting the business. At the close of the year, from 500 to 600 creameries were reporting monthly. A careful analysis of these reports show a heavy loss to many creameries and to the farmers supplying them, owing to lax methods and the absence of system in keeping records. These losses are computed to be not less than $5,000,000 a year for the entire country. Whenever reports indicating defective work are received, letters are written pointing out the defects and suggesting remedies."[115]

Summary

In investigating the work which the Government did prior to 1913, it is seen that agriculture was confronted with

many present-day problems a number of years ago, and there was much sound thinking on these problems. The activity of the government, however, was for the most part limited to calling attention to these problems, and impressing upon the farmer the importance of quality, catering to demand, and following these practices which would result in better production and marketing practices. It was not until the nineties or possibly the early years of the present century that the Department of Agriculture really began to study the problems of the market and other economic phases of agriculture, and attempted to make the results of these investigations of some practical value to the farmer and those in the trade. A study of the activities of fifteen or twenty years just preceding the establishment of the Office of Markets leads one to the conclusion that some very effective and fundamental work was done, and that in this period the foundation upon which the economic work of the Department now rests was firmly built. Not only did this period give a body of information, but it developed a technique and trained some men around whom the later development grew.

There was not a change in the Governmental policies in 1913, but merely a change in organization so that the activities which were well under way could be better organized and given a better opportunity to develop and a great expansion of the work. The real change which took place at that time, and which has been more pronounced as the years have passed, was that the economic phases of agriculture were separated from the technical. In the earlier years the economic and market work was conducted by the technical staff. Under the new order the economic phases are segregated and handled by an economic bureau which, to a large degree, is manned by economists.

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[61] U. S. Dept. of Agr. Rept. of Com. of Agr. 1864, p. 13.
[62] U. S. Dept. of Agr. Agricultural Yearbook, 1897, p. 273.
[63] U. S. Patent Off. Annual Rept. of Com. of Patents, 1842, p. 3.
[64] Ibid., Part II. Agr., 1849, p. 309.
[65] Ibid., 1850, p. 200.
[66] U. S. Dept. of Agr. Rept. of Com. of Agr. 1864, p. 9.
[67] Ibid., 1884, p. 10.
[68] U. S. Dept. of Agr. Agricultural Yearbook, 1895, p. 15.
[69] Ibid., 1904, p. 433.
[70] Ibid., 1908, pp. 214-215.
[71] U. S. Patent Off. Annual Rept. of Com. of Patents, 1841, p. 75.
[72] Ibid., 1842, p. 49.
[73] Ibid., p. 63.
[74] Ibid., p. 50.
[75] U. S. Dept. of Agr. Rept. of Com. of Agr. 1873, p. 242.
[76] U. S. Dept. of Agr. Agricultural Yearbook, 1894, p. 9.
[77] Ibid., 1896, p. 37.
[78] Ibid., 1902, p. 16; ibid., 1904, p. 43.
[79] Ibid., 1903, p. 236.
[80] Ibid., 1911, pp. 23-32.
[81] Ibid., 1906, pp. 371-386.
[82] U. S. Patent Off. Annual Rept. of Com. of Patents, Part II, Agr., 1857, p. 320.
[83] U. S. Dept. of Agr. Rept. of Com. of Agr. 1870, p. 247.
[84] U. S. Dept. of Agr. Rept. of Secretary, 1891, p. 24.
[85] U. S. Dept. of Agr. Agricultural Yearbook, 1908, p. 214.
[86] Ibid., 1911, p. 10.
[87] Ibid., 1908, p. 125.
[88] U. S. Dept. of Agr. Report of Com. of Agr. 1869, p. 449.
[89] Ibid., 1872, p. 347.
[90] Ibid., p. 446.
[91] U. S. Dept. of Agr. Agricultural Yearbook, 1908, p. 213.
[92] Ibid., 1909, p. 81.
[93] U. S. Patent Off. Annual Rept. of Com. of Patents, Part II, Agr. 1844, p. 289.
[94] U. S. Dept. of Agr. Rept. of Secretary, 1892, pp. 434-435.
[95] U. S. Dept. of Agr. Agricultural Yearbook, 1912, p. 451.
[96] U. S. Dept. of Agr. Rept. of Com. of Agr. 1866, p. 378.
[97] U. S. Dept. of Agr. Agricultural Yearbook, 1912, p. 357.
[98] Ibid., 1910, p. 135.
[99] U. S. Patent Off. Annual Rept. of Com. of Patents, 1843, p. 86.
[100] Ibid., 1845, p. 774.
[101] Ibid., 1848, p. 637.
[102] Ibid., p. 705.
[103] Ibid., 1850, pp. 511-512.
[104] Ibid., 1852, p. 444.
[105] U. S. Dept. of Agr. Rept. of Secretary, 1889, p. 69.
[106] Ibid., 1890, pp. 320-321.
[107] U. S. Dept. of Agr. Agricultural Yearbook, 1896, p. 49.
[108] Ibid., 1901, p. 32.
[109] Ibid., 1903, p. 39.
[110] Ibid., 1904, pp. 42-43.
[111] Ibid., 1910, p. 74.
[112] Ibid., pp. 44-45.
[113] Ibid., p. 476.
[114] Ibid., 1907, p. 112.
[115] Ibid., p. 38.

GRAPHICAL PRESENTATION OF THUENEN'S THEORY OF INTENSITY[1]

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Perhaps the most important of all doctrines of the neighboring fields of economics and agriculture is Thuenen's Theory of Intensity. This theory was set up and founded in 1826 by Johann Heinerich von Thuenen in his work "The Isolated State with Respect to Agricultural Economics."[2] Even though that book dealt with a whole array of problems in addition to the theory of intensity, its principal worth lies in the intensity theory; that is, in the study of the circumstances and systems of management under which agriculture is conducted more extensively, or more intensively.

Thuenen's book called into being a quantity of literature almost unsurveyable and one which is almost daily increasing. There is probably not a text on agrarian policies which does not give attention to Thuenen's teachings. In economic circles the importance of Thuenen's work has always been recognized, especially since Roscher in his treatise "Ideas on the Policies and Statistics of the Systems of Agriculture."[3] and later in his "Text on Agricultural Economics,"[4] analyzed Thuenen's ideas and beautifully illustrated them with classical examples.

In economics circles Thuenen's work has always had consideration, but this cannot be said of the rural economists. That part of agriculture which deals most with the economics, especially farm management, has, until recently, proceeded almost oblivious to the teachings of Thuenen. The "Handbook of Agricultural Management"[5] is a classical example. Von der Goltz was director of the Agricultural Institute at Jena, and was long considered an author-

[1] *Graphische Darstellung der Thünenschen Intensitätstheorie by* DR. RICHARD KRZYMOWSKI, Professor of Agricultural Economics at the University of Breslau, Silesia, Germany. Stuttgart: Eugene Ulmer. 1927. A booklet.

[2] "Der isolierte Staat in Beziehung auf Landwirtschaft und Nationalökonomie."

[3] Ideen zur Politik und Statistik der Ackerbausysteme"—published in The Archives of Political Economics. 1845.

[4] "Lehrbuch der Nationalökonomik des Ackerbaues"—1859: 14th edition by Dade.

[5] "Handbuch der Landwirtschaftlichen Betriebslehre" by von der Golz: 2nd edition, Berlin: Paul Parey. 1896.

ity on farm management, yet one finds no trace of the teachings of Thuenen in his exhaustive book. Only after the death of the writer did the new editor, von Seelhorst, in Goettingen, devote a few words to Thuenen's theory.[6]

Only in the present century has Thuenen's theory been acknowledged as an integral part of farm management study. Aereboe has given especial attention to it. In his important writings[7] he has not only included it but has made Thuenen's theory the very center-point of the whole science. Even though one may not entirely agree with Aereboe's work and his deductive reasoning of the old classical school of economists, yet one must acknowledge that he classified the theories and enriched them with new points of view. We cannot here go further into Aereboe's presentation; that would take us too far from our theme."[8]

The mechanics of the mathematical demonstration of Thuenen's theory has, until now, found little consideration in texts and special works on Thuenen.[9] The centerpoint of Thuenen's theory is a question of the comparative advantages of intensive and extensive agricultural enterprises. By an extensive business one means a business which uses little capital and labor per unit of area. Thus intensive and extensive are by nature relative and not absolute conceptions. Extensive culture, through gradual increase in the use of capital and labor input, gradually becomes intensive culture.

Thuenen's theory, which fundamentally explains the intensive and extensive culture, is in reality based on the law of diminishing productivity, which has also been called the ground and soil law, the law of production on land, and the law of decreasing profit increase.[10] This law has been

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[6] In the 4th edition. Berlin: Paul Parey. 1912.

[7] "Die Bewirtschaftung von Landgütern und Grundstücken." Part 1. Berlin: Paul Parey. 1917.

[8] Recently Laur of Zurich, Switzerland, has also undertaken the further development of Thuenen's zones of production. "Einführung in die Wirtschaftslehre des Landbaues." Berlin: Paul Parey. 1920. p. 119.

[9] Professor Krzymowski discussed the mathematical principles in a paper entitled "Short Discussions on the Subject of Agriculture and Natural Science." Winterthur: Moritz Kieschke, 1900. This treatise has never become well known.

[10] *Brinkmann* rightly calls the Law of Diminishing Productivity the "Fundamental Law of Agriculture."

Mitscherlich, "Landwirtschaftlichen Versuchstationen" 75: 231, 1911; and 77: 413, 1912 is primarily interested in the shape and form of the production curve, whether it be a straight line function or a logarithmic function; and what may be the limiting factors. The "Law of the Soil" and the "Law of the Minimum" (discussed in Spillman and Lang) were shown to work together in diminishing productivity. Mitscherlich also called it the "Law of Physiological Relations."

known for a long time. The school of physiocrats used it; at least it was represented by Turgot. The British classical school, as for example, Senior, attributed great importance to the law, and it occupied a prominent place in the Malthusian population theory. Naturally the validity of the ground and soil law was attacked from many sides by economists as well as by agriculturalists. We cannot go deeper into this question, which, in itself has called forth a formidable amount of literature, but we wish briefly to state that we recognize the law as correct. The effectiveness of the law may be postponed through technical agricultural development but it can never be annulled.

It is important for the following presentation that we keep the working of the law clearly in mind. A few examples will aid us in this. Through what means can one increase the production of a given area of crop land? Through better preparation of the seed-bed, better fertilization, choosing higher yielding varieties, careful seeding, increased care in harvesting, etc. All these means are, however, of limited effectiveness. Plowing often makes soil productive, but only within certain limits. If one plows too often one loses the advantages. Deeper plowing may also, under certain conditions, be advantageous, but even here care must be exercised lest one bring sterile subsoil to the surface so that the productivity of the area will decrease and not increase. Thus the cost of production increases in proportion to the work which is put into the land but the yield increases less rapidly. With increased care in seeding the situation is similar. Drilling with machines has many advantages and also saves seed as compared with hand seeding. But should we wish to go even farther and, as is the case in China and Japan, put each grain or plant into the ground individually by hand in order to economize seed and secure a more even stand, then our costs would be so high that every native farmer would quit. If we try

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Spillman, "The Law of Diminishing Returns," by Spillman-Lang. World Book Co., 1924, discusses the law in its three intregal parts—(1) "The Law of Diminishing Increment," (2) "The Law of Diminishing Returns on Basic Capital," and (3) "The Law of Diminishing Returns on Working Capital."

Black, "Production Economics," Henry Holt and Co., 1926, pp. 276 mentions also the names of "The Law of the Proportion of Elements of Production," and "The Law of Resistance." He draws clear distinction between the physical and the economic aspects in "The Principle of Diminishing Physical Outputs," and "The Principle of Diminishing and Increasing Economic Inputs."

to increase the yield through better fertilizers, we soon reach definite limits. Much more than 130 to 200 pounds of saltpetre per acre[11] cannot be withstood by ordinary wheat without lodging. We might extend the maximum limit of production through all kinds of expensive practices such as carefully distributing fertilizer, or by irrigation to supply the plant with necessary water in dry weather. These expensive measures, however, will pay only under certain conditions. The chief specialist on irrigation systems in Germany states that such installations will probably pay only in dry sections of Germany.[12] The losses of grain through harvesting can also be reduced but for this we need to cut the grain with a sickle instead of a scythe. This takes much time and is therefore so expensive that it does not pay in most cases. The yield would be yet greater if we cut each head with a pair of scissors and threw it into a basket or a sack so that no grain would be lost. This process finds daily use but only in grain-breeding gardens where each single spear is of such value that the great amount of time consumed is repaid. Such a method is naturally out of the question for the larger field practice. We see that the law of diminishing productivity works everywhere in crop production.

The same is also true of animal production. We can increase the gross production from cattle by choosing more productive breeds, feeding the animals better, stabling them better, choosing matings more carefully, keeping records of production, watching the health of the animals by a veterinarian, etc. One uses these practices more or less according to the intensity of the culture. But one must always consider just how far he should go in increasing the care so that the output will pay the additional cost. Each additional unit of input yields a decreasing product in livestock production as well.

In middle Europe one finds several distinct systems of agriculture with corresponding stages of intensity. If we arrange these in order, beginning with the most extensive and ending with the most intensive, we have something as

[11] 1½ to 2½ double centner per hectare of land. Krzymowski refers to Aereboe, pp. 203-4.

[12] Reference is made to Krueger in Berlin, and Zunker in Breslau.

follows: grazing; hay production; periodically abandoning crop land to waste land, burning it over, and then using it for crops again; irregular rotation of hay and pasture with crops; regular rotation of the same; rotation of cultivated with non-cultivated crops; rotation of cultivated crops; fertility so great that no definite rotation is necessary; and finally, gardening.[13] Thuenen, in his "Isolated State" showed which positions these different systems of culture assumed under specified conditions. In the picture of the isolated state the more intensive systems are found nearest the city. Nearest the city is a circle devoted to gardening, then follows a circle with "free" culture, a culture so intensive that it is free from the necessity of rotation; then comes the Mecklenburg "koppel" culture, a specially intensive form of crop rotation; then, the "three-field" culture, rotation of cultivated and non-cultivated crops with permanent pasture lands; and at last an expanse of impenetrable, unpopulated wilderness which separates the "State" from the rest of the world. Thuenen also discussed the location of forestry with respect to the other systems, but in order to make this picture as simple as possible we shall omit discussion of it.

If we ask why the different systems follow upon one another according to their degree of diminishing intensity as we proceed from the city to the periphery, then the answer is that the location of the different systems is determined by the price conditions of the agricultural products. In the city the farmer receives the same price for the same quantity and quality of produce regardless of where it was produced. But he who is further from the city has to pay greater transportation costs; the nearby farmers have a great advantage. After deducting transportation costs they receive a higher price than their more distantly located associates.

The detailed calculation of Thuenen shows that under otherwise similar conditions high prices of agricultural products make an intensive business most profitable and low prices make an extensive business most profitable. Thus the phenomenon: as the nearness to town increases, the

[13] A liberal translation. The author designates each system by a name generally recognized in German agriculture but meaningless if translated literally.

intensity increases. When we carry the picture of the isolated state into reality we find that intensive systems of culture are found in densely populated lands with higher prices, and extensive systems in sparcely populated lands.

The developments which Thuenen employed in order mathematically to prove these hypotheses are complicated and necessitate a toilsome study. The reading of "The Isolated State" is on the whole not an easy matter. Roscher[14] was the first to give a simple explanation of the mathematics which forms the foundation of Thuenen's theories. For comparison Roscher considers four systems of farming which are of very different degrees of intensity. As most extensive he takes a Siberian system and designates it by an S. Then follows the usual crops-and-pasture rotation, D; thirdly, a still more intensive Mecklenburgish "Koppel" system of crop rotation, M; and finally, as most intensive, the Flanders rotation of cultivated crops, F. He assumes the following figures for yields of grain and costs of production on a given area:

	S	D	M	F
Yield in bushels (Scheffel)	400	1200	3000	7000
Costs in dollars (Taler)	50	300	1000	3000

The figures as assumed obey the law of diminishing productivity. The most extensive system, the Siberian, brings forth 400 bushels of grain with a cost of $50. The next system has six times the cost of production but it does not produce six times the yield, which would be 2,400 bushels. In accordance with the theory of diminishing productivity it produces much less. Roscher takes as example only half, or 1,200 bushels. The next system, the Mecklenburg rotation, is even more intensive, having $1,000 cost, more than three times the cost of the preceding system, but the yield, again, does not increase in proportion. Only 3,000 bushels are produced. The same is repeated in the Flanders cultivated-crop rotation system. Here $3,000 costs, three times that of the Mecklenburg system, bring not three times the yield, but only 7,000 bushels.

The profitableness, and through it the existence, of the different systems is not determined by either the gross yield

[14] *Op. cit.* It is evident that the costs of production as given do not include a charge for the use of land.

or the cost of production alone, but by the net return. This, however, varies with the prices of the produce. Roscher calculates next the net proceeds or returns from an assumed grain price of *one-fourth dollar* a bushel. One secures from the different systems the following net returns:

S	D	M	F
$+50	± 0	$-250	$-1200

With so low a grain price only the Siberian system yields a profit. All other systems make no profit. The proceeds are zero in case of the three-field culture; in the Mecklenburg rotation a direct loss; and a much greater loss in the more intensive cultivated crop rotation. With low prices of agricultural products only the extensive systems of culture are profitable.

Now Roscher takes a case of double the former grain price, so that the value of the grain produced is twice what it was before. But, what, in this case, are the costs of production which one has to deduct from the grain value in order to secure the net returns? As we go toward the central city in the isolated state the prices of all agricultural produce are higher. In the same way the costs also increase but not by far in the same ratio. The farmer, for example, has to pay more for the food which he has to buy for his labor; even the wages are higher because of the increased cost of living, etc. But at the same time many things are cheaper near a large city. All goods which one has to get from the town, machinery, and many industrial products, clothing, etc., are cheaper than they are at a greater distance from the town. Summarily stated: as one nears the city agricultural products rise markedly in price and naturally the gross value of production rises proportionately but the expenses of the farm do not increase nearly as much. Roscher assumes, as for example, that by doubling the grain price, the cost of production of a business increases only one-half. With this assumption, at a price of *one-half dollar* per bushel of grain, our four systems are:

	S	D	M	F
Value of products	$200	$600	$1500	$3500
Cost of production	75	450	1500	4500
Net Returns	+125	+150	± 0	−1000

Here the picture has already moved markedly in favor of the three-field system D; this one now gives the highest net return, and the extensive Siberian system no longer does.

As prices rise further the more intensive systems are continually the most profitable. At a price of *one dollar* per bushel the corresponding figures are:

	S	D	M	F
Value of products	\$400	\$1200	\$3000	\$7000
Cost of production	112.5	675	2250	6750
Net Returns	+287.5	+525	+750	+250

At a price of *two dollars* a bushel of grain:

	S	D	M	F
Value of products	\$800	\$2400	\$6000	\$14000
Cost of production	168.75	1012.5	3375	10125
Net Returns	+631.25	+1387.5	+2625	+3875

This table shows how, with higher prices of agricultural products, the more intensive systems continually yield the higher net returns.

Roscher's table caused the author to reflect whether it were not possible to present in universally true, mathematical, and graphical form, what Roscher shows in individual examples of figures. The graphical presentation has always the advantage of greater perceptibility. After much experimenting, two quite simple methods of presenting the respective laws of Thuenen by means of curves were discovered.[15]

The starting point is the law of diminishing productivity (Fig. 1).[16] We erect a right-angled system of coordinates.

[15] The author acknowledges the assistance of his brother, Oscar Brockman, Dip. Ing. of Zürich and Dr. Kneser of Breslau.

[16] Mitscherlich, Spillman, Black and others have shown curves similar to Fig. I differing from it in minor detail only. Attention needs, however, especially to be called to the fact that curves of production are usually depicted as increasing to a maximum point and then decreasing. This curve never decreases. The difference lies in the fact that the curves of production as most frequently presented show the effect of increased application of a single element of input. It is, for example, easily possibly to apply so much nitrogenous fertilizer that, other things being constant, the yield decreases and even reaches zero. Professor Krzymowski considers all factors of production including labor and management as being used together and represents the amount of their use as total cost of production other than the cost of the use of land. In this case the production cannot decrease, for, under rational management no single factor would be used to the extent of its being a detriment. Application of that element would be decreased and that of other elements yet as a relative minimum would be increased.

On the abscissa axis we put the cost of production of an agricultural enterprise calculated per unit of area, or what amounts to the same thing, the degree of intensity of the enterprise. The costs which we expend in the cultivation of a specified area serve us as measures of the degree of intensity. The ordinates of the corresponding abscissa serve to represent the gross value of production.

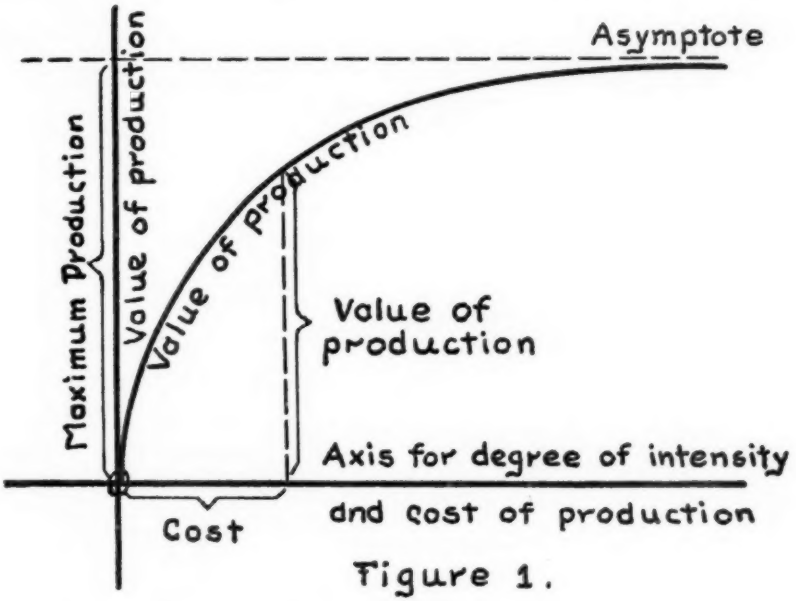

Figure 1.

The greater the input of capital and labor, the greater is the intensity of the enterprise and the higher is also the production, but, according to the law of diminishing productivity, the increase is not in proportion to the increase in input. If we picture a certain agricultural enterprise conducted in different degrees of intensity, and if we plot the corresponding abscissa and ordinates for every degree and draw a curve through these points, then we shall have a production curve which begins at zero and rise rapidly in a curve whose convex side is uppermost. The farther we go to the right the more slowly does the curve rise because, with increasing intensity, production increases less and less until finally its rise is imperceptible and it ap-

proaches a horizontal asymptote. We must remember that the gross production cannot increase above a certain maximum limit. If we plot this maximum on the ordinate axis and draw a horizontal line through it then this gross value of production curve will always tend to reach this line asymptotically because the curve will almost coincide with the line if carried far enough.

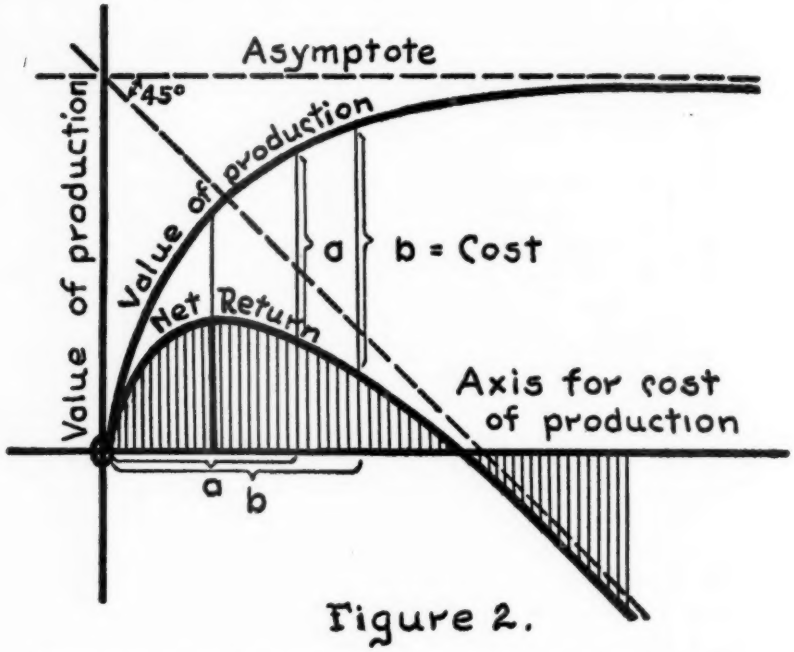

Figure 2.

How can one show net return in comparison with the production curve? There are two ways in which this may be done.

One way (Fig. 2) is by subtracting each abscissa from the upper end of the corresponding ordinate. The ordinates represent the value of production and the abscissa the cost of production, and if we subtract the cost of production from the value of production then the net return remains. If we do the same with all the ordinates and connect the upper ends of the net return ordinates we secure a new curve which will represent the net return and is then called the net return or profit curve.

Figure 2 shows the form of the curve. It also originates at zero, rises to maximum, the point of greatest profit, and then falls, reaches the abscissa axis and crosses it. From this point the curve becomes negative, that is, there are no profits, but losses instead. From this illustration we see what degree of intensity the enterprise will assume under the conditions assumed for the graph. A business must, to be rational, adopt the degree of intensity which corresponds to the maximum net return.

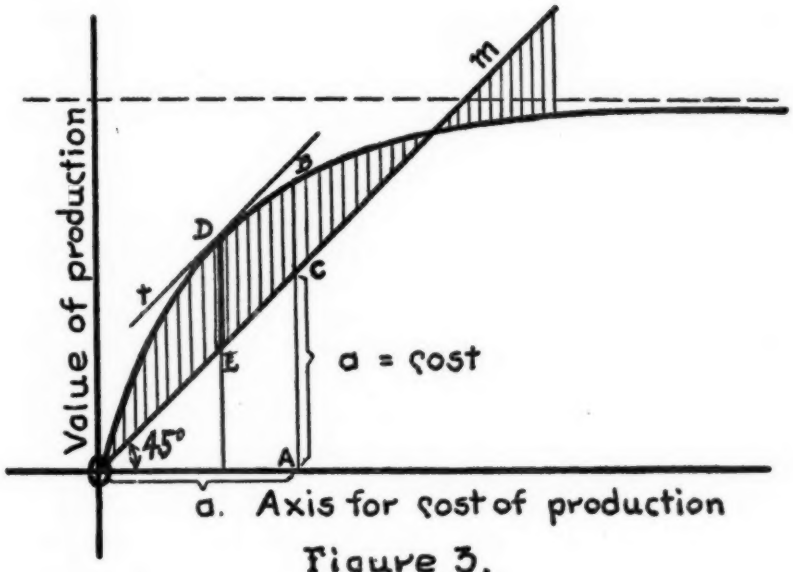

Figure 3.

In examining Figure 2 we see that the negative part of the curve also approaches an asymptote, which, in our illustration, is represented by a dotted line. We will not here consider why this is true since for our purpose it need not now receive further consideration.

In the other method which we can use in the representation of the profit or net return curve (Figure 3) we subtract the abscissae not from the upper but from the lower end of the corresponding ordinates. The remainder of the value-of-production ordinate is naturally the net return. The subtraction of the abscissae from the lower end of the

ordinates is made simply by drawing a line *m* from zero which forms an angle of 45° to the coordinate axes. One sees from Figure 3 that, for example, with the distance CA = OA; consequently, the distance BC, the remainder of the value-of-production ordinate, represents the net return. Where in this illustration are we to find the greatest net return? The maximum net return must be at the point where the tangent to the curve of production is parallel to the line *m*. For those who are versed in higher mathematics it might be said, that in our illustration, the maximum net return lies where dy/dx, the differential-quotient, is equal to the trigonometrical tangent of 45°.

As a means of showing the mathematical proof of Thuenen's theory of intensity we may now choose either of the two methods: the first, (Fig. 2) in which the net return curve plays a part, or the second, (Fig. 3) which we have just explained. We will use the second method and arrive at our conclusions from it. All that follows, however, may be derived from the first method as well.

The next step is to set forth the fundamental principles of Thuenen's theory. It is, expressed briefly, as follows: at high prices for the products, a higher degree of intensity must be used than at lower prices. The maximum net return at high prices is achieved only through intensive culture, and at low prices through extensive culture.

If we wish to express this mathematically we must remember that Thuenen maintains in his theory that when the prices of agricultural products are higher, the costs of production will also be higher. In proximity to the central city of the isolated state the farmers receive higher prices for their agricultural products because the transportation costs are less; but their costs of production are also higher. Yet, and that is the important point—the costs of production do not rise as rapidly as the prices of agricultural produce because of the reasons which have already been presented. If the price of products near the central market is perhaps double that of a certain distance, then the input, or costs of production instead of being double, are perhaps only 1⅓ or 1½ times as great.

We wish now to consider how an increase or decrease in

the costs of production can be graphically shown and what effect such an increase or decrease will have on the intensity of the enterprise. In our diagrams the costs of production can be varied simply by turning the line *m* about the zero point (Fig. 4).

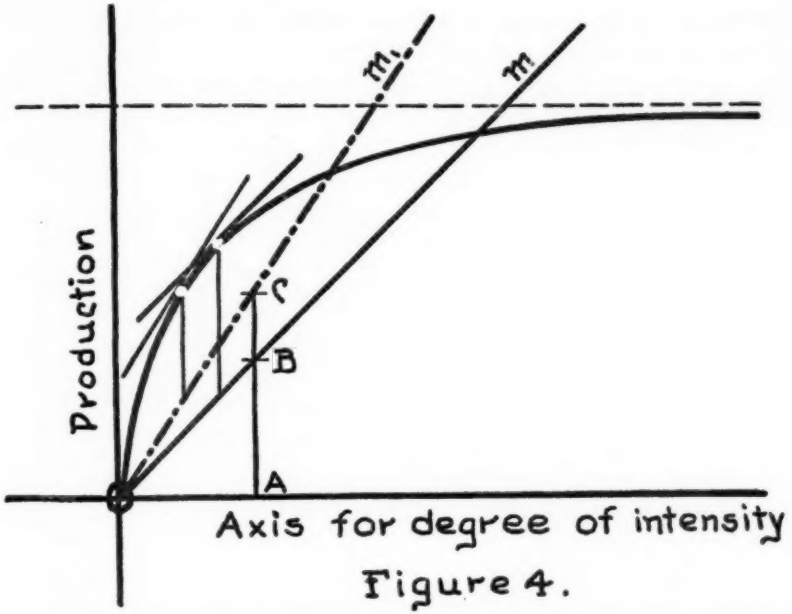

Figure 4.

Let us assume that the costs of production are 1½ times as great as before. We draw at will an ordinate AB as before: by increasing its length to 1½ times we secure AC. Then we draw through C and O a new line m_1. We see that for every amount of input and every degree of intensity this new line represents a cost of production 1½ times as great as before. But what effect has such an increase in the cost of production on the intensity of culture? Our graph gives an accurate answer. The greatest net return is always to be found where a line tangent to the curve is parallel to line *m*. If the line is turned up to the position of m_1, then the tangent and its point of contact move to the left; in other words the greatest net return moves to the left. This simply means that the maximum net return is now to be secured from a more extensive

culture. (A smaller abscissa denotes a smaller input and a more extensive culture, while a larger abscissa denotes a more intensive agriculture.[17]

Thus we have demonstrated one part of Thuenen's theory: when the costs of production rise and all other conditions remain constant the intensity of farming must decrease. Conversely, when the costs of production fall *ceteris paribus,* intensive operation is in order.

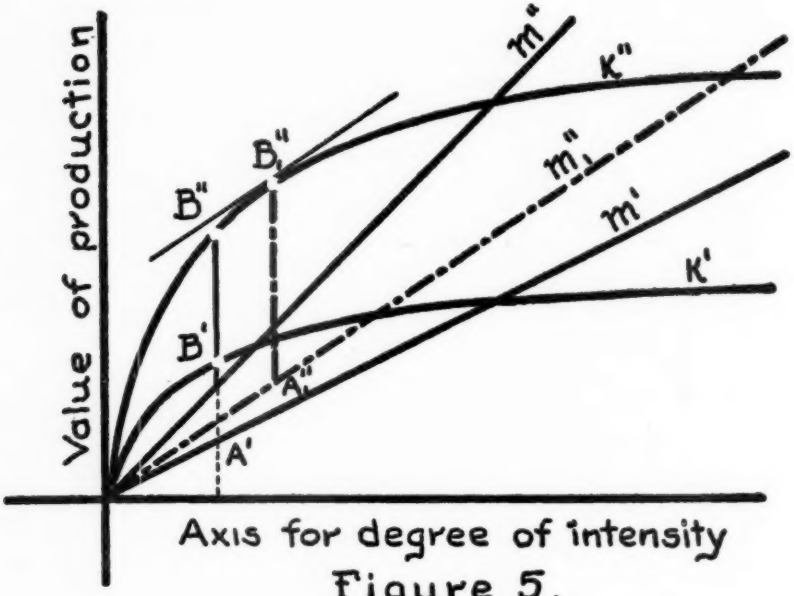

Figure 5.

Let us now consider the situation when both the cost of production and the price of the products, wheat prices for example, vary at the same time. For the sake of simplicity we assume that the prices of products and the cost of pro-

[17] In Figure 3 the author has used the same unit of measure for the costs as for production. For example, if the distance of an inch on the abscissa represents $100 costs, then an inch distance on the ordinate represents $100 worth of product. Only when this is true does *m* form an angle of 45° with the coordinate axes, and only when this is true is the maximum net return to be found where the differential-quotient on the curve of production is equal to 1. In Figure 4 the author no longer employs a measure common to both abscissa and ordinates alike. An inch distance on the abscissa still represents the same physical amount of capital and labor but it is not necessarily worth $100.

Where a common measure is used for both abscissa and ordinate (Figs. 1, 2, 3, 6 and 8) the author has labeled the abscissa, "Axis for cost of production," and where it is not a common measure (Figs. 4, 5 and 7), "Axis for degree of intensity.

duction are exactly doubled; thus both rise in the same proportion. The situation is represented by Figure 5.

The curve K′ represents the curve of value of production at former prices, and the line *m′*, the former costs of production. The maximum net return under these conditions is shown by A′B′. If we now think of the grain prices and the costs of production as both being simultaneously doubled then we have curve K″ and the line *m″* in which the ordinates are twice as large as the corresponding ordinates of K′ and *m′*. It is easy to see that in this case, namely when prices of products and costs of production have both risen in the same ratio the intensity of culture dare rationally not be changed because the point of maximum return does not move to the right or the left but remains at the same distance from the ordinate axis. This is evident from a careful examination of the graph and it can be nothing else, because, for the same intensity, we have in the doubled price of products and doubled cost of production simply doubled the height of the ordinates and doubled the net return: the mutual ratio of all the ordinates to one another remains exactly the same. Then we find the maximum net return again at the same intensity.

But according to Thuenen's theory the prices of agricultural products and the costs of production do not rise proportionately; the costs of production rise less than the prices of agricultural products. Therefore, to present Thuenen's theory, we should not double the costs of production when we double the price of products but should assume a lesser increase for the costs. In other words, we should not turn the line *m′* so far upward about the zero point that it reaches the position of line *m″*, which represents a doubling of the cost of production, but should turn it less, so that, for example, it takes the position of m_1'', represented by a dotted line in the illustration. Where, now, are we to find the maximum net return? The point of maximum net return moves to the right in the figure. It reaches the position of A_1'',B_1''. This means that the business must be more intensive than before if one is to attain the maximum net return. Thus we have proven the vital point of Thuenen's theory: with higher prices of agricul-

tural products the business must be more intensive, and at lower prices, more extensive.

One sees that with our method the changing position of the most profitable intensity is demonstrated by the movement, the sliding, of the tangent. The maximum net return is always where a tangent to value of production curve is parallel to the line *m*, which represents the cost of production. If the tangent moves to the right the culture must be more intensive, and if it moves to the left, more extensive.

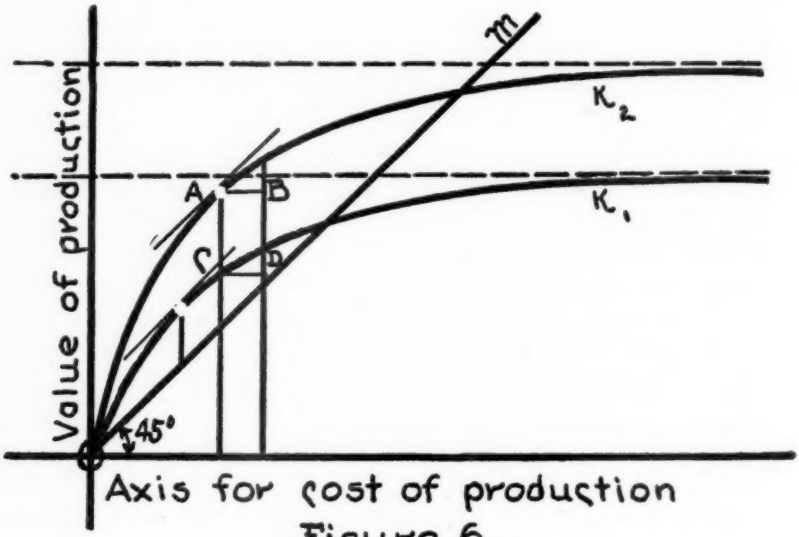

Figure 6.

The above demonstrated premise, that a raising of the price of products brings with it an increase in intensity, is the most important point of Thuenen's theory of intensity. In addition to it there is naturally an array of other premises. Probably the most important of these is that not only a rise in the price of products but also an improvement in the quality of the soil may condition a greater intensity of culture. This rule also can be demonstrated by our method although the proof belongs in the realm of higher mathematics. I shall merely briefly mention it here for those who are versed in infinitesimal calculus. If the

input of production is expressed in monetary units then the abscissa represents costs. The line *m* in this case lies at an angle of 45° to the axes. The maximum net return is where dy/dx, the differential quotient, is equal to the trigonometric tangent of 45°, that is, 1.

In Figure 6, K_2 represents the value-of-production curve on better land and K_1, on poorer land. It is evident that at equal costs of production one receives a higher production on better land; the ordinates of curve K_2 are greater than those of curve K_1; the curve K_2 falls higher on the graph than curve K_1. We now look for maximum net return by applying the geometric tangent to curve K_2, the curve of the better soil. Here the differential-quotient is equal to 1. That is to say, an infinitesimally small addition in the input results in an exactly similarly sized, infinitesimally small increase in the output. What is now the condition on the less productive soil if we consider the same degree of intensity? The probabilities are that an infinitely small addition in the expenditures will result in an even lesser increase in product because the input into production is less effective on the poorer soil. The differential quotient is therefore probably smaller than 1; the maximum net return is not to be found here. We must go farther to the left in order to find the differential-quotient with the value of 1; the maximum net return. This means that farming must be more extensive on poor soil than on good soil if one is to obtain the maximum net return, which was to be proven.

Finally we come to a consideration of the influences which taxes and tariffs and similar duties exert upon the intensity of an agricultural enterprise. In this connection Thuenen[18] considered two kinds of duties, which, according to his theory, affect agriculture in two different ways. He says: "The consumption tax, insofar as it includes the necessities of life as salt, flour, etc., the head tax, the livestock tax, the customs, the industrial tax, the stamp tax and many other taxes collectively burden the farms in proportion to the size of their businesses and without consideration of the net return of the soil." With the expression: "collectively burden the farms in proportion to the size of their busi-

[18] Thuenen presents these principles in Part III of Vol. I.

nesses," Thuenen meant to say, as is evidenced by his discussion, "burden the farms in proportion to the measure of intensity of their businesses," in other words, in proportion to the amounts of capital and labor expended per unit of area. Thuenen deduces that all these taxes have the effect of lowering the intensity of an agricultural enterprise. Entirely in contrast with this is the affect of another tax, the land tax. Thuenen comes to the conclusion that the land tax is not able to affect the intensity of culture at all.

These principles of Thuenen which deal with the effects of taxes on the intensity of agriculture again allow of simple demonstration by our graphical method. With respect to the taxes which are calculated on a basis of gross production, as for example, the old now-forgotten tithe, we need no proof in order to show that they make the enterprise more extensive. The effect of higher or lower product prices on the intensity has already been presented in Figure 5. We need only to make clear that a tax of the nature of the tithe must have exactly the same effect on the intensity as a lowering of the grain prices. For the peasant, it means exactly the same whether he is to give up 1/10 of the gross production as a tithe or whether the grain prices fall to 9/10 the former worth. In the one case as in the other he can use for himself but 9/10 of the originally produced value. Thus a tithe must have exactly the same effect as a lowering of grain prices. The same is the case with share rent, "le metayage," in which the renter pays the landlord a rent in the form of a fixed portion of the gross production.[19]

The other taxes which Thuenen mentioned, the consumption tax, the head tax, duty on the goods which the farmer must use in production, etc., also induce more extensive culture. These are taxes which increase much in proportion to the intensity of the enterprise and thus act as though the costs of production had been increased. An estate which has twice as many laborers as another is also subject to twice as great a consumption tax. In similar fashion other forms of taxes grow almost in proportion to

[19] The economist Rau "Lehrbuch der politischen Oekonomie" has tabularly arranged examples showing how the tithe has the tendency to make the enterprise more extensive.

the increase in intensity; the effect of extensification is easily apparent from Figure 7.[20]

Finally we come to the land tax which consists of a payment from land rent. If a tax is assessed on land rent then the state determines the amount an agricultural area must

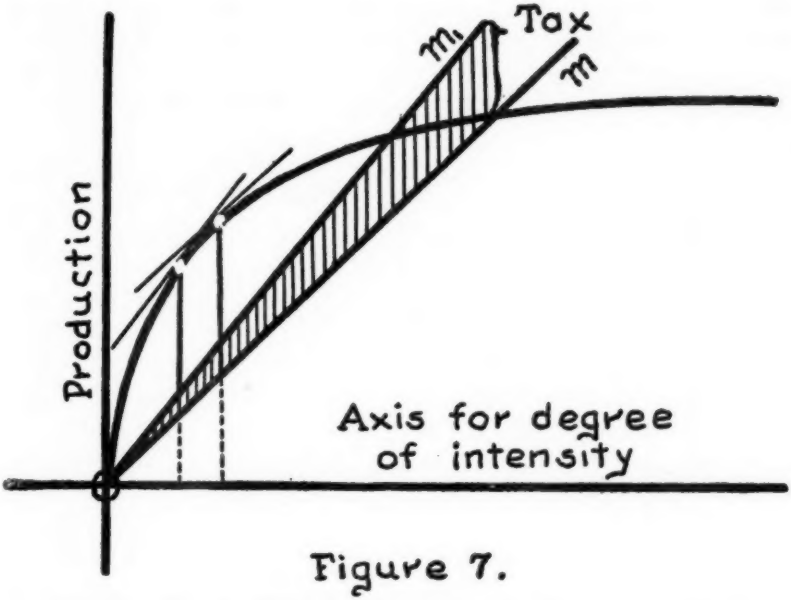

Figure 7.

pay by an appraisal of its productive value entirely without regard to how extensively or intensively the particular enterprise is conducted. Here a fixed sum regardless of the degree of intensity must be added to the other costs of production, and deducted from the gross value of production in order to secure the net return. Figure 8[21] represents this case and shows us at once that with such a tax the maximum

[20] In this case the goods used in production are taxed; the greater their use the greater the tax. Line m represents the costs other than the tax and line m_1 the costs including the tax. A line tangent to the curve of production and parallel to m_1 falls farther to the left than a tangent parallel to m. This means that the point of maximum return is farther to the left denoting a lesser input per area and hence a more extensive culture.

[21] Here the author has shown the effect of a tax on land. Since the amount of land is fixed, the amount of tax is fixed regardless of what amount of other input factors are used on the land. m represents the costs of inputs other than tax, and m_1 represents the total inputs including the tax. It is to be noted that even at point O, when no other inputs are expended, the tax on land still exists. The total costs thus go through O_1 instead of O. It is then evident that a line parallel to m will also be parallel to m_1 and tangent to the curve of production at the same point, hence calling for the same degree of intensity.

net return goes neither to the right nor the left; in other words, a fixed charge from the land rent cannot have any influence on the intensity of culture. We again arrive at the same conclusion as did Thuenen.

I will not have to emphasize especially that taxes, payments, etc., exert these influences only "in abstracto." We eliminated all other factors at the first. In actual farming the state of affairs is naturally more involved. Small pay-

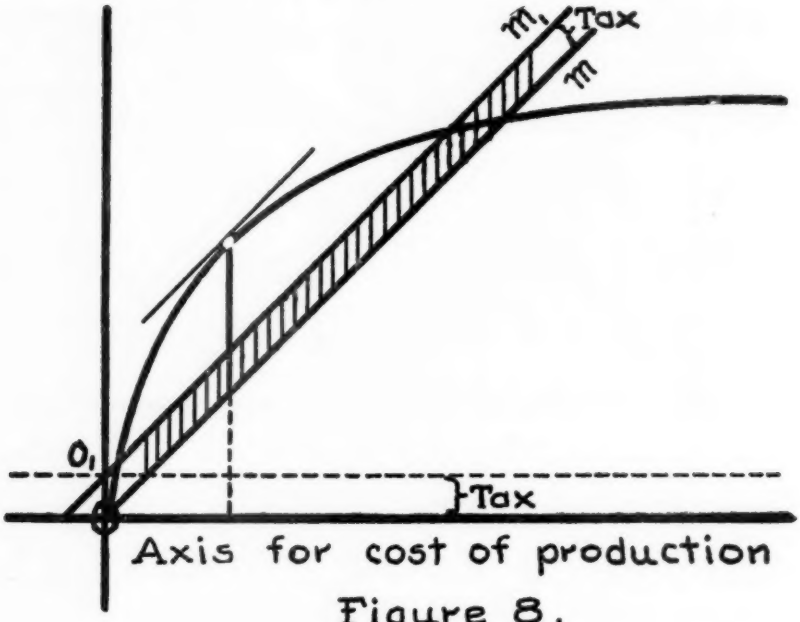

Figure 8.

ments of taxes have perhaps no effect at all. But the effect of even higher taxes is often nullified by other factors. Actual life is a real mixture of factors and the abstract mathematical consideration refuses to function.

Our graphical presentation of Thuenen's theory may be used in yet other problems, as for example, a discussion of the question of what influence the price of land has on the intensity of culture. Also, what influence the intensity of an enterprise has on the proportion of gross returns which are net returns. We will allow the presented discussion to suffice.

In closing we should like to mention that our graphical method, as is the case with every mathematical method, is not suited for determining the most profitable degree of intensity under the special conditions of a specified enterprise. For this, one would have to know the accurate course of the value of production curve for the single enterprise and that is impossible. We can know its general course but not fix it with mathematical accuracy. The curves which we have used in our preceding figures are only assumed examples which suffice to make the principle visible but which fail us in the individual cases.

The practical farmer determines the most profitable degree of intensity in most cases, not always, according to his many years of experience; or, expressed differently, through an agricultural intuition and instinct which he has acquired through years of experience. He may err in such judgment but there exists no better procedure.[22]

If important technical developments occur which appreciably change the course of the value-of-production curve, i.e., increase the value of production for the same costs of production, then the position of the most profitable intensity will also naturally be changed; the enterprise will become more intensive.

Summary of Literature on the Graphical Method Which the Author Has Cited

A. D. Hall, in England, is quoted by Brentano as apparently being the originator of the principle. He based his work on wheat fertilizer experiments at Rothamsted in 1852-64. The reference contains one diagram but no application.

Brentano, German, in "Agrapolitik," Gotta, Berlin, 1925, cites Hall on pp. 111 and 112.

Clausen, Schleswig-Holstein, published a brief statement of the principle in "Landwirtschafts-Zeitung," No. 32, 1895. It contains one simple diagram and no mathematical explanation.

Krzymowski, 1900, as cited in the text footnote 9 presented a work similar to the present one.

Adolf Krämer of Zürich, Switzerland, was the fourth in "Stand und Ziele der Schweizerischen Landwirtschaft," Frauenfeld: Huber. 1904. He represented the curve of production in the form of a colored bar chart.

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[22] Further discussion of this phase is taken up by the author in "Philosophie der Landwirtschaftslehre," (Stuttgart: Eugene Ulmer. 1919), in which he discusses the effects of historical, traditional, geographical, and environmental factors.

Clausen in Heide again was heard from in "Landwirtschafts Schulzeitung," 105, pp. 353, "Ein neues Lehrmittel in der landwirtschafts Betriebslehre" in which he described a model constructed by himself.

Brinkmann in Bonn was fifth in "Fühlings landwirtschaftliche Zeitung," 1910, pp. 465, "Ueber Intensität und Rentabilität des landwirtschaftlichen Betriebes." (He used one rather complex but valuable diagram.)

Waterstradt in Breslau, criticized this method in "Landwirtschaftliche Jahrbücher," 1903, in "Untersuchungen über den Einfluss des umlaufenden Betriebskapitals in den verschiedenen Wirtschaftssystemen."

Clausen again in 1925 in "Mitteilungen der Deutschen landwirtschafts Gesellschaft," No. 40, "Etwas zur Geschichte des Wirkungsgesetzes," compares the author's method with Mitscherlich's law of the growth factors. Krzymowski holds such a comparison as invalid because the production curves of Mitscherlich obey a logarithmical order which is not claimed for the author's curves. Krzymowski's curves consider not only the factors of growth but all the factors in agricultural production. Mitscherlich's presentation is considered as the presentation of a special case while the author presents the situation in general.

Mitscherlich himself in the "D.L.G." No. 49, of 1926, comments on Clausen's comparison and shows the validity of Krzymowski's method.

Wölfer in Schleswig (without date but recent) has put out a popular graphical presentation in the form of a wall chart called "Das Bodengesetz." This is critizised as being obscure, complicated and mathematically incorrect.

THE "REPRESENTATIVE FIRM" IDEA APPLIED TO RESEARCH AND EXTENSION IN AGRICULTURAL ECONOMICS

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In recent years a great deal of attention has been directed toward what may be termed the "programizing" of farming. State and local agricultural programs of one sort or another have been developed in various parts of the country with the view of bringing about a better adjustment in the organizations and practices of the rank and file of farmers.

To be most effective, such programs in the first place must be correctly conceived and secondly they must be predicated upon accurate descriptions of the specific group or groups advised, otherwise they will be too general to be of much value. Blanket recommendations for the co-called "average" farmer are too indefinite. They furthermore are likely to be misleading, due to the wide variations found among farming systems and farmers. What is needed is a segregation of farmers into specific groups on given sizes of farms and in homogeneous type of farming areas so that an appraisal of the needs of typical groups and an interpretation of the effect which changing economic conditions are likely to have upon them can be made.

An approach, such as this, involves a great deal of descriptive analysis of farming systems and farming conditions preliminary to effective program making. Many problems arise incident thereto which call for a more careful analysis and a more precise terminology than has heretofore been accorded it. It is with these problems that this paper deals.

In developing new concepts or in clarifying or redefining old ones frequently it is possible to suggest new shadings and refinements in meaning by using terminology developed in other and related fields. In the particular problem under consideration a better understanding of the concept we are trying to develop will be had if we call to our aid the "repre-

sentative firm" idea conceived by Professor Alfred Marshall and developed by him and by Professor Taussig.[1]

Marshall's Idea of a Representative Firm

In connection with his discussion of the causes governing the normal supply price of a commodity Marshall pointed out the necessity of analyzing the normal cost of producing the commodity relative to a given aggregate volume of production. For this purpose the costs of a "representative firm" he considered would be the best to use. By a "representative firm" he meant[2] "one not far in the lead, not equipped with the very latest and best plant and machinery, but well equipped, well led and able to maintain itself permanently with substantial profits." Side by side with such a "representative firm" are the exceptional leaders. Side by side with them also are the weak and struggling—some under inept management and doomed to failure and others under good management but still in early stages of scant capital and unestablished connection.

When conditions are normal in the industry the representative firm earns "fair" profits—such business profits as business men of good ability secure in industry at large. Their superiors earn much more. Their inferiors earn less, perhaps go to the wall, perhaps rise slowly to better fortune. If now an ill turn is encountered by such an industry the first effect will be to cause the weak and struggling firms to disappear, the representative firm to lose money or at least to fail to make money, the leading firms to submit to lessened profits—the converse takes place if an industry has a good turn, then everybody makes money even the ill equipped.

As thus defined Marshall was thinking of a representative firm in an efficiency or expenses of production sense. Later on in his discussion he also considers it in other senses—from the standpoint of size, of organization, etc. The size of the representative firm, he says, in the main is governed by the general expansion of the industry in which it is

[1] See Marshall, A., Principals of Economics, Eighth edition, Book IV, Chapter XIII, Page 317; Book V, Chapter III, Page 342; Book V, Chapter V, Page 377; Book V, Chapter XII, Page 459-60.

[2] See Taussig, F. W., Principals of Economics, Book II, Chapter 50, Page 184.

found. Changes in technique and the costs of transport also have an influence. Side by side with it are found both smaller and larger firms. Some of which through favorable location, through adoption of new machinery, new technique and the like have expanded more rapidly than the representative firms. Others less favorably circumstanced have developed more slowly. Likewise in connection with his discussion of the principle of substitution he clearly is thinking of the representative firm in an organization sense. All entrepreneurs do not react in the same way. Some shift more rapidly than do others, expanding in this direc-

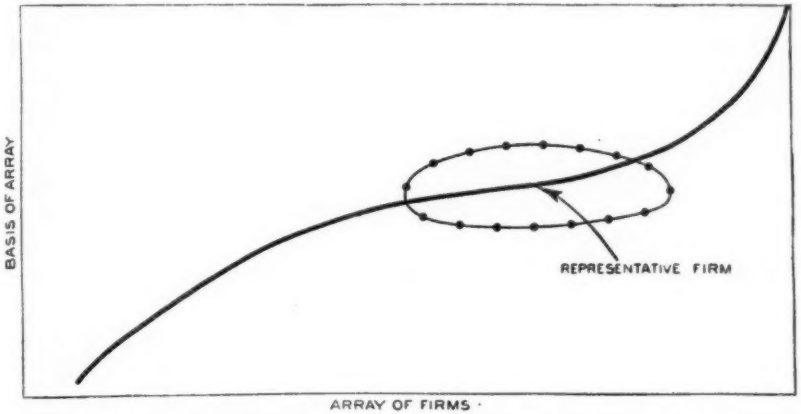

FIG. 1. THE APPROXIMATE POSITION OF THE "REPRESENTATIVE FIRM"
The firm selected as representative may be any of a considerable number having rather small differences with respect to the criteria.

tion or that direction in accordance with their expectation of receiving greater returns from the utilization of their resources. When considered from this standpoint firms array themselves in a manner similar to the other cases.

This interpretation of Marshall's idea of a representative firm is illustrated graphically in Fig. 1. If firms be arrayed on basis of their costs, returns, size, organization or what not a curve will result with about the general slope as shown. The circled portion represents the general area within which the representative firm as conceived by Marshall is found.

Just as Marshall and Taussig, by developing the concept of a representative firm, made more definite their reason-

ing on problems in theoretical economics so can we clarify our thinking on the farm problem and make our research and extension more definite and concrete if we adopt a device of a similar nature. This device we will call, following their terminology, a "representative or typical farm." But whereas they had to be content with a more or less abstract idea the agricultural economist has the opportunity of finding in any part of the country actual farms which are typical of farming systems prevailing.

A Typical Farm is Analagous to a Representative Firm

A typical farm as herein conceived is very closely related to Marshall's representative firm. It may be defined as a modal farm in a frequency distribution of farms from the same universe; or it is a farm which is representative of what a group of farmers are doing who are doing essentially the same thing. A farm of course may be typical of a group in size, in organization, in methods and practices, in tenure and many other things. In this discussion it will be considered primarily from the standpoint of size and organization although the methods developed are just as applicable to the other lines mentioned.

Typical farming systems, as thus defined, are found in every well established farming community. In new areas they are less distinct than in old developed regions. Adjustments to new conditions come slowly. There is always a certain amount of instability and uncertainty. Many things have to be learned and these mostly by trial and error. Eventually out of the accumulation of such knowledge and experience there evolves a settled conviction or policy as to what is the best system of farming to follow under the prevailing conditions.

But there is not complete unanimity of opinion regarding this. This is because farmers are as they are. They do not all see alike, react alike or produce under the same financial circumstances. First we have the exceptional men. They are the leaders in the community who point the way. They are the first to adopt new methods, new technique, new varieties of crops. They are also the first to make adjustments in their production to meet changed or changing

economic conditions. They make money because they are alert, look ahead, and make the most of their opportunities. At the other extreme are the poor and struggling, limited in managerial capacity and limited in means. Nothing seems to turn out right for them. They either are continuously jumping from one thing to another or are completely static and never change. If prices are good they make some money but do not accumulate and get ahead. If prices are low they are forced out or continue to hang on until their capital is gone and then revert to the status of hired men or try their hand at something else.

Both of these groups are in the minority. Between the two extremes come the mass of farmers who are neither the best nor the poorest. Being in the majority they determine what is most commonly found as to size of farm, as to organization or as to practices. They are the typical farmers and their farms are the typical farms. Yet they do not stay put nor are their farming systems or practices static. What is typical of them today may be entirely out of date and unrepresentative five years or ten years hence. They change their scale of operation, their combinations of crop and livestock enterprises, their practices with the expansion of the industry and with development in new technique, new machinery and new methods. The changes now taking place in the wheat belt of the Great Plains Region due largely to the introduction of the combine-harvester thresher and wider use of tractor power are illustrative of such a movement. Hence typical farming systems cannot be determined once for all time. It is necessary to check up on them every few years to see what has taken place or is taking place. This is particularly true in areas such as the one just mentioned or in any other area where rapid changes are taking place.

While the typical farms are changing the farms of the exceptional men are changing still more. By focusing attention upon them and what is typical of their operations and comparing them with what is typical of the mass of farmers we can measure not only the progress made but the probable difference in returns the majority could expect were they to do the same thing. In a similar way we can

measure the change that has taken place from one period to another and determine if the change on a whole has been a profitable one and whether it should be accelerated or retarded. So it is important to consider these different typical groups as distinct and direct attention to their separate organizations and practices rather than upon some intangible average of them which nowhere exists.

We can probably make this discussion more objective if we take a specific illustration and follow it through showing more in detail what is meant by typical farms and how they are arrived at.

Our first concern in determining typical farming systems in any particular region is to analyze the agriculture of the region to ascertain its uniformity with respect to crop and livestock organizations and with respect to such physical factors as soil type, topography, precipitation, length of growing season and the like. From this analysis we are enabled to segregate the different parts of the region into type of farming areas in which the organizations and conditions are similar.

With the area of study narrowed down to such type areas, the next step is to select one or more representative sub-areas within the type area and obtain the organization of every farm in it as a basis for generalization for the whole area. The number of sub-areas to select for this purpose depends upon the size of the area and upon its uniformity. Often it is necessary to select more than one such sub-area in order to show the complete range in conditions found. If such be the case, typical farming systems must be determined for each one. Usually a sample of from 200-500 farms is sufficient to give an accurate picture of the organizations found.

Having such a sample, the farms are first sorted by size. This gets the farms of the same size together and further gives the relative frequency of the farms of different sizes. From this relative frequency we can determine at once the most common or typical size of farm found. An inspection of such an array of farms in almost any area will show that a rather wide range in size exists. If an average (arithmetic mean) be taken of all the farms within the range, as

is frequently done, an average farm will result but obviously it is not representative, nor will it accurately describe the entire array. The dispersion of the large and small farms around the average will be so wide that the average can never be taken as representative of them. But with the farms sorted into size-groups this error is avoided.

When we come to consider the organizations in the area, a similar or even more pronounced situation is found. The range in organizations is almost as wide as the range in size. Instead of trying to determine an organization typical of the farms of all sizes, the analysis is restricted to the farms of a particular size, and farming systems typical of these sizes are determined. The analysis is made as follows: The farms of a particular size are arrayed on the basis of the most important enterprise in the area. The amounts of the other enterprises handled on each farm are also included to show the complete organization. Thus when completed the array shows the organization of every farm in the size-group and further throws the farms with the same organization together. The farms with the same or essentially the same organization are the typical groups, and the average of these groups is our typical farm. Instead of taking an arithmetic mean of these groups the mode or median is usually taken. This can be done very accurately by inspection thus avoiding lengthy computations.

That an analysis such as this gives a much more accurate and definite picture of the farming systems found than is obtained when an average of all farms is taken is illustrated by the following examples.

In Fig. 2 is shown a sample of one hundred farms of all sizes from a representative type of farming area in the Hard Winter Wheat Belt. This sample is representative of what is found in the area both from the standpoint of the size of the farms included as well as the proportions of the crops and livestock handled. Wheat and sorghum occupy three-fourths or more of the crop area. There is a very wide range in the acreage of each crop on the different sizes of farms, wheat ranging from 0-400 acres and sorghum from 0-335 acres. Each horizontal bar in the

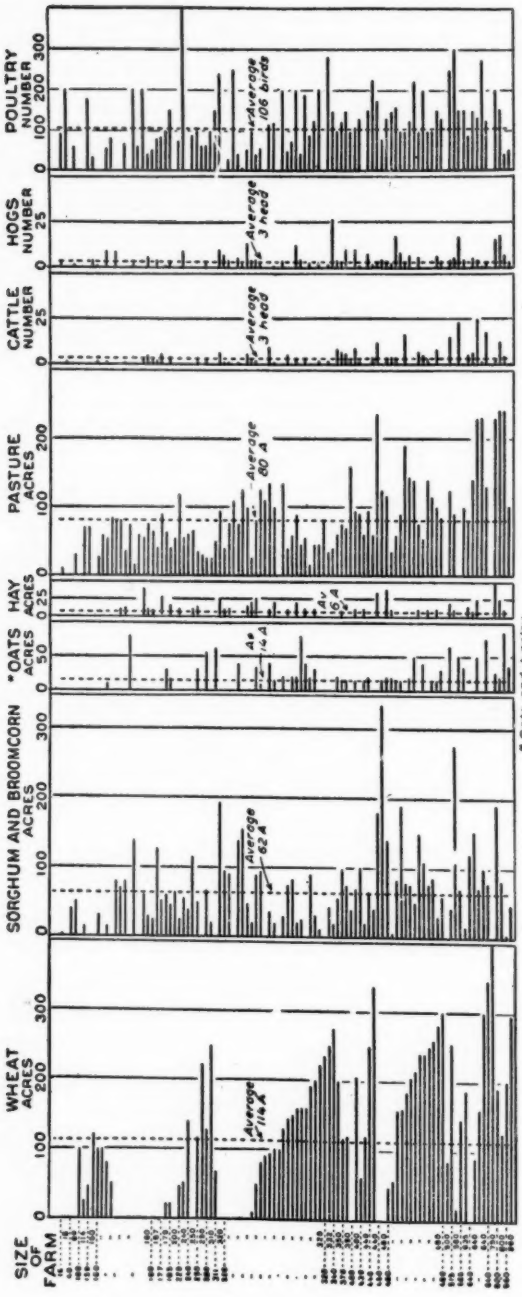

FIG. 2. VARIATION IN ORGANIZATION: FARMS OF ALL SIZES

Each line gives the organization of one farm. (100 farms in a representative area in the hard winter wheat belt.)

chart represents the amount of each enterprise found and the sum of the different enterprises across the page total to the size of farm given on the left. The dotted lines running vertically through each crop represent the arithmetic means of the acreages of these crops. That these averages are not representative of the averages shown for the different crops is evident. In the case of wheat, for example, 26 of the 100 farms in the sample have no wheat at all. 18 have twice as much or more than the average and the remainder vary all the way between these two extremes. This gives a standard deviation in acreage of wheat of 104 acres and a coefficient of variability in acreage of 91.4 per cent. In the sorghum acreage the dispersion around the mean is even greater, the coefficient of variability being 97.9 per cent. That conclusions based on the average of such a distribution are erroneous seems quite clear, yet averages of farms varying just as widely in size and organization as these are made continuously.

That greater precision than this can be obtained by breaking up the sample into farms of a particular size and showing them separately is shown in Fig. 3. For this purpose all of the 320 acre farms in the original 450 farm sample are used and arrayed according to their acreage in wheat. There is still to be noted considerable variability in the acreage of the different crops, but it is not quite so pronounced as in the case of the farms of all sizes. In fact the standard deviation in acreage of wheat drops from 104 to 79 acres and the coefficient of variability in acreage from 91.4 per cent to 76.1 per cent. In the sorghum and the other crops the same downward tendency is to be noted.

Despite this tendency toward greater precision, however, it is evident that even an average of the farms of a particular size is not representative of all the component farms comprising it. But in this distribution there is to be noted a tendency of the farms to be grouped around certain organizations. Thus (beginning at the top of the chart and going down) there is a group of 15 farms that have about the same acreage of wheat. The acreage of the other crops grown also may be ascertained by following across the page. This group is indicated by the brace designated (a). Imme-

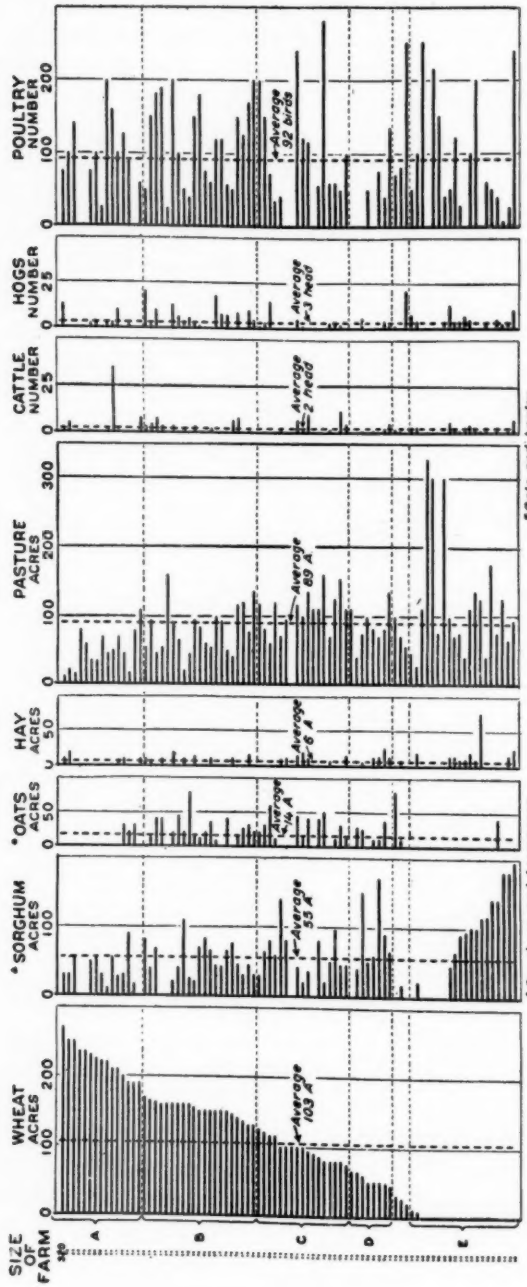

FIG. 3. VARIATION IN ORGANIZATION: FARMS OF A PARTICULAR SIZE
These farms (all of them 320 acres in size) are located in the same area as those in Fig. 2, and part of them are included in that graph.

diately below these farms is another group, larger in number designated (b) that are doing about the same thing but are growing considerably less wheat than the group just above. Likewise below this group are two other groups (c) and (d) one with still a smaller percentage of its crop area in wheat and the other with no wheat at all but with a high acreage of sorghum.

This tendency of the farms of the same size to array themselves into specific groups furnishes the key to the precision we have been seeking in the analysis. Thus instead of one "average" organization on the 320 acre farms in this area there really are four organizations, each of which is distinctive enough to be typical or representative of what particular groups of farmers are doing; or each is the modal farm of its specific group. These are the typical farming systems which we have been seeking. They are typical of what a group of farmers on given sizes of farms and in homogeneous type of farming areas are doing who are doing essentially the same thing. Such typical farming systems are determined for each size of farm and in final form appear as shown in Table 1.

The greatly increased precision which such a grouping adds to the analysis is evidenced by the large decrease in the dispersion in the acreage of wheat and sorghum on the farms in each typical group around their average as compared with the dispersion of the farms of all sizes and a particular size, taken from the same sample, around their averages. (Table 2)

The standard deviations and coefficients of variability are much smaller for the typical groups of farms of one size than for either the farms of all sizes or for all the farms of one size. The dispersion of the sorghum acreage even for the typical groups is still quite wide, however, even though much lower than for the other two samples. This is to be accounted for by the distortion in the averages occasioned by the inclusion of the extreme farms in the calculation. In actual practice these extreme farms are considered freaks, the modal acreage rather than the arithmetic mean being taken as representative of the actual acreage on the farms of the group.

Even greater precision than here shown may be attained simply by reducing the group ranges.

It is apparent from the foregoing illustrations that the use of an average as representative of a distribution either for farms of all sizes or for farms of a particular size is likely to be quite misleading. To get a truly representative

TABLE—1. TYPICAL FARMING SYSTEMS FOR FARMS OF DIFFERENT SIZES IN A REPRESENTATIVE AREA IN THE HARD WINTER WHEAT BELT[1]

Item	Typical 160-acre farms				Typical 320-acre farms					Typical 480-acre farms			
		No Wheat			Wheat					Wheat			
	Most common: 60–100 acres wheat	30 to 50 acres sorghum	70 to 95 acres sorghum	120 to 150 acres sorghum	Most common: 190–250 acres	150–170 acres	120–140 acres	60–100 acres	No wheat high sorghum	Most common: 220–250 acres	260–300 acres	160–200 acres	60–100 acres
Relative[2] frequency of the type	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent
	33	14	17	16	25	18	10	20	13	30	22	20	20
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
All crops	115	65	100	130	255	240	205	130	190	365	350	310	215
Wheat	80	0	0	0	220	160	130	80	0	240	280	180	80
Sorghum	20	45	85	130	30	40	45	60	140	80	40	80	100
Oats & barley	10	0	0	0	0	30	20	30	0	30	20	40	20
Hay	5	10	15	0	5	10	10	10	15	15	10	10	15
Broomcorn	0	10	0	0	0	0	0	0	35	0	0	0	0
Pasture	40	60	40	25	50	60	110	120	100	100	120	130	140
Livestock	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Work-animals	4	5	5	5	8	8	7	6	6	10	10	10	8
Cows	2	5	4	3	4	5	4	2	3	5	5	6	6
Young stock	1	3	2	1	1	3	2	1	1	4	2	4	5
Other cattle	0	1	1	0	0	1	1	0	0	1	1	2	2
Sows	0	0	0	0	0	0	1	0	0	0	0	0	0
Other hogs	2	3	0	0	2	4	4	0	3	5	3	8	6
Poultry	80	80	80	180	120	120	150	60	60	125	125	125	125

[1] Organizations have also been determined for other sizes of farms in the area, but only the most important sizes are shown here. The 160-acre farms represent 22 per cent; the 320 acre farms 29 per cent and the 480-acre farms 16 per cent of the farms of all sizes.

[2] The percentage figures indicate the relative number of farmers on each size of farm who follow the particular organization. It will be noted that in most cases they do not total 100 per cent. This is due to the fact that the remaining farms of each size group are either freaks or are too scattered to group.

figure it is necessary to sort the farms into size groups and then strike within each size group and determine what the typical (modal) organization is in each group. By so doing much greater precision and accuracy will be attained.

From this it follows that comparisons showing, for example, the relation of the organization or returns from an individual farm with the average of farms of all sizes and types, or with the "ten best" or "ten poorest farms" is likely to be misleading and in fact may have little meaning.

As usually presented the average as well as the best and poorest include farms of all sizes and types—such a comparison would be much more effective and accurate if only farms of the same size and type were compared—at least the comparison would not be of unlike things as frequently happens when used in the other way.

TABLE 2.—AVERAGES AND MEASURES OF DISPERSION OF DIFFERENT GROUPS OF FARMS TAKEN FROM SAME LOCALITY IN THE HARD WINTER WHEAT BELT

Sample	Average acreage in		Standard deviation in acreage of		Coefficient of variability in acreage of	
	Wheat	Sorghum	Wheat	Sorghum	Wheat	Sorghum
	Acres	Acres	Acres	Acres	Pct.	Pct.
1. Farms of all sizes	113.6	62.1	104 2	60.8	91.4	97.9
2. Farms of one size	103.7	54.6	78.9	46.7	76.1	85.6
3. Typical groups of (2) (a)	221.7	39.9	23.3	21.0	10.5	52.6
(b)	151.9	47.5	10.6	28.1	7.0	59.2
(c)	96.5	59.1	15.0	31.2	15.6	52.7
(d)	47.7	97.5	8.4	46.1	17.7	47.2
(e)	—	112.9	—	49.2	—	43.6

Relation of Typical Farms to Agricultural Programs

State and governmental agencies in their job of advising the farmer are desirous of making their recommendations as specific as possible. The diversity in organization of farms in different areas and in the different (also same) size-groups in the same area suggests the inadvisability of making "blanket" recommendations for farmers as a whole. On the other hand it is impracticable to go to the other extreme and attempt to advise every individual farmer. The time and expense are too great even though the ideal plan might be to give each farmer individual attention and advise him in the light of the conditions on his own farm. The alternative is to take a middle course and seek to advise groups of farmers who are doing essentially the same thing.

But the fact that a group of farmers in a particular area are following a certain organization of course does not necessarily mean that the organization is the most profitable for them to follow in the long run. For example, farmers in dissimilar type-of-farming areas can be found who are following almost the same organization. That they should

do so of course is by no means assured. It is at this point that the difference between the typical farm and "standard farm", or long-time system of farming, is brought into clear relief. *The one represents what a group of farmers working under a set of homogeneous conditions is doing at a particular time; the other shows the goal toward which they are working or should work.*

Starting with these typical farming systems in each area and using the latest information on production requirements, production and price trends, yields, etc., a basis is provided for determining what long-time system of farming is likely to yield the greatest returns under the conditions likely to be encountered in the area.

In working out these long-time systems of farming it is necessary of course to recognize that no one system would be adapted to the conditions of every farmer in the area. Hence, more than one system must be set up to meet the special conditions and desires of specific groups.

Use of Typical Farms in Making More Definite the Agricultural Outlook

Another important use to which the typical farming systems in an area may be put is in providing a definite basis for determining profitable year to year adjustments which need to be made in them in the light of prospective prices of products and cost goods. Changes in prices either up or down affect the profitableness of farming systems, but they do not affect all farming systems or farmers in the same way. For specific groups of farmers who are following the same organization, however, their effect will be approximately the same. Because of this fact, farms typical of a specific group may be used as a basis for determining what the probable effect of such changes will have upon the farmers in the entire group. Until the outlook is localized in this way and interpreted to the individual farmer in terms of an organization with which he is familiar its meaning may not be sufficiently definite to be helpful to him.

One important reason why farmers have not always acted upon the recommendations of advisory agencies has been

that they felt such recommendations did not apply either to their conditions or their needs. This, for example, is the weakness of all programs which call for a flat "decrease of 10 per cent" (or some other figure) in the acreage of some crop or number of a particular class of livestock because of a prevailing low price. Such recommendations overlook the fact that there is a wide variation in the size of such enterprises handled both by individual farmers and by typical groups of farmers—that while it may be decidedly to the advantage of certain ones to make as much decrease as recommended; others may find it advantageous actually to do the opposite and increase their production of the product.

"The cow, the sow, and the hen" type of philosophy, which in its extreme form proposes to put each enterprise on every farm in sufficient numbers "to take care of home needs plus a few to sell" has the same weakness. The conditions and needs of all farms are far from being the same and furthermore such a universal increase might if carried out have a disastrous effect upon the price of the product.

If recommendations are made, however, in the light of the conditions and needs of typical groups on given sizes of farms and in homogeneous type-of-farming areas such errors will be minimized. Extension and research agencies can make definite recommendations to these specific groups and be assured that they have a direct application.

Relation to Other Lines of Research

There are still other ways in which this general concept of a typical farm fits in with other lines of work. For the research worker the typical organizations are the starting point for farm organization studies. They provide a basis for working out budgets of receipts and expenses to be used in testing out the relative profitableness of various combinations of enterprises at varying yields and prices of products and cost factors.

The division of particular regions or States into specific type of farming areas also facilitates and adds to the accuracy of studies on elasticity of supply. By localizing

such studies to specific type of farming areas the significant price-supply relationships can be more accurately determined. The important relationships are not as likely to be obscured as may happen when areas are thrown together and averaged.

Income studies likewise would be more definite and usable if they were made by type-of-farming areas and analyzed and presented by typical groups instead of by a composite grouping of farms of all sizes and types. Likewise any studies made with the view of obtaining methods and practices from which general standards are to be derived will be more representative if they are confined to type-of-farming areas.

In these and many other ways this method of approach may be used to advantage in adding to the accuracy and precision of many studies. As it comes to be used more generally, the character of both the research and extension work in the field of Agricultural Economics will improve.

THE BROOKMIRE ESTIMATES OF CASH INCOME OF FARMERS

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The Brookmire Economic Service has for several years estimated the current cash income of the farmers of the United States, this being one feature of the estimates of total money income of the country. Estimates of income and purchasing power are of primary value in setting sales budgets and in establishing quotas for sales territories. Variation in the amount of income from year to year and from State to State, as well as the level of per capita income, have an obvious bearing on sales problems.

The question of farmers' income is of importance from two different angles. In the first place, we have the farmers as a market for manufactured products; in the second place, as producers of raw materials for use in the factories and of food to feed the urban population. There is evidence to indicate that in general the agricultural industry is more important as a producer of food and raw materials than as a market for manufactured products. Hence, in the long run, the volume of agricultural production is probably of greater interest to business men than the amount of farm income. Nevertheless, the amount of money received by farmers is often a very important influence on business conditions in any given season. Furthermore, there are certain industries such as the manufacturers of farm implements and fertilizers, mail-order houses and perhaps producers of low priced automobiles and certain types of work clothing, which are primarily affected not by the volume of farm output, but by the purchasing power of the farm market. From the standpoint of the farmer himself income is obviously the paramount consideration.

The concept of farm income is to be defined in the light of the purpose for which the information is desired. From the standpoint of the farmer himself, the important items are, first, the purchasing power of actual net income. This includes the cash receipts applicable to his own labor and

capital investment, the quantity of produce which he consumes off the farm direct, the gain or loss in inventory of livestock and equipment, and the increase or decrease in the value of his land.

From the viewpoint of the business man, however, the true net income of farmers and its purchasing power are of little direct significance. What he is interested in is the amount of cash receipts which the farmer has available for the purchase of manufactured products, many of which outlays represent expense items and are properly deductible if we seek to establish net income. The available cash income is cash receipts minus taxes and interest paid. If wages of hired labor be subtracted, the balance represents the available cash income of farm operators who naturally purchase the bulk of capital goods, such as implements, building materials and motor vehicles consumed on the farm. The trend of land values is also important from this point of view, in that it influences the degree of optimism or pessimism prevailing in the rural districts. Furthermore, it may be assumed that the trend of land values will affect the amount of savings which will ordinarily be made out of current income and accordingly the farmer's standard of living. If land values are rising rapidly, this income automatically provides the land owning farmer with a competence for his old age. If land values are stationary or declining, on the other hand, the farmer must save out of current income to acquire a stake for the future.

The estimate of the actual cash receipts of farmers presents considerable difficulty, owing to the lack of satisfactory statistics on the commercial activities of farmers. Very excellent and comprehensieve reports on agricultural production have been available for many years. Quite complete estimates of the prices of farm products are also published by the United States Department of Agriculture. But the amounts of various farm products which actually leave the farm instead of being consumed there are less easy to ascertain. The only way of securing a true indication of cash receipts, however, is to establish the amount of the various products leaving the farm and the average

price received. Then, by simple multiplication, actual money receipts can be computed.

The actual volumes of various products sold off the farm each year are established by reference to a large number of statistical reports and estimates from various sources. These include reports of the United States Department of Agriculture on the amount of grain and hay shipped out of counties where grown, car-lot shipment of fruits and vegetables, stockyard receipts and slaughter, value of dairy and poultry products, etc.; the Census Reports of 1910, 1920 and 1925 on sales of numerous crops, livestock and animal products; reports of the United States Grain Corporation on farmers' sales of various grains for the crop years 1917 and 1918; reports of stockyard companies and various trade publications; reports of State Agricultural Statisticians on production and shipments of agricultural products.

Prices used are those reported monthly by the United States Department of Agriculture. In order to obtain a true average price for the season, these monthly prices must be weighted according to the movement off the farm throughout the season. Thus, the bulk of the winter wheat crop moves from farms in the months of July, August and September, while the bulk of the corn is marketed in December, January and February. Manifestly, a simple twelve months' average for either of these would be erroneous. Practically all farm products are highly seasonal in their movement. These seasonals are established for all of the leading products through records published by the United States Department of Agriculture, based on estimates by crop reporters or on actual statistics of railroad movement. By weighting the price each year in acordance with this seasonal movement a true average price is secured. This is then multiplied by the number of units leaving the farm to obtain the cash income figure. Some deviations from this direct procedure are necessary in certain instances, but in the main this is the course we have regularly pursued.

The above method is applied with some modifications to

States and counties. Statistics for States and counties are less complete and less reliable than those for the country as a whole, but results are attained which check well enough against the figures for the whole country to establish their practical usefulness.

This method lends itself not only to historical estimates of cash income but to advance estimates, or forecasts, at the beginning of the agricultural year. As soon as production forecasts become available about July 1st an estimate of the probable price for the season is made for each product on the assumption of output as forecast. With supply thus taken as a known quantity the underlying demand situation is carefully appraised and a base price set. Subsequent changes in estimates of production are recognized by inverse variations of the price estimate. In this way it is often possible to estimate in July cash receipts for the ensuing year more closely than physical production can be forecast.

As an example of this method, suppose that on July 1 the cotton crop is forecast at 15,000,000 bales. It is estimated that a 15,000,000-bale crop will bring 16 cents, middling spot, at New York. If the crop forecasts should be increased to 16,000,000 bales the price forecast will be lowered to 15 cents. In this way a scale of prices is built up; 13,000,000 bales—20 cents, 14,000,000—17½ cents, 15,000,000—16 cents, 16,000,000—15 cents, 17,000,000—13½ cents, 18,000,000—12 cents. This is, in fact, the scale on which we forecasted cotton income last summer for the 1927 crop. In July when the crop was estimated at about 14,500,000 bales we forcasted a price of 15 cents to the farmer (about 16½ cents New York spot) making a value of $1,188,000,000 for the lint. The final outturn was 13,000,000 bales at about 20 cents, making $1,300,000,000. The net price to the farmer was about equal to the average New York price as the crop graded above middling. For the 1928 crop, we adopted a tentative scale in August based on 15,000,000 bales at 20 cents, New York middling, equal to about 18 or 19 cents on the farm depending on the average grade of the crop.

Such estimates as the above are made for each major

crop using our own and Government forecasts of production; they are made likewise for livestock and animal products, estimates of production being based on reports of numbers of animals on farms, pig and lamb crops, trend of stockyard receipts, etc.

Tables 1 and 2 present figures showing farm income for the United States and for the nine major agricultural sections from 1909 to date.

The objects of farmers' expenditures are a subject of no little interest. The statistical basis for estimates of expenditures unfortunately is less adequate than that of the income estimates. Certain of the more important items of outlay, however, can be estimated reasonably satisfactorily as a rough indication of the distribution of farmers' expenditures. An estimate for 1927 of the major items of capital expenditure is appended. (See Table 3).

The items listed by no means cover the whole range of farmers' expenditures but only those for which some fairly reliable data exist. The estimates on interest and taxes include all such payments made out of farm income whether paid by farm operators or by landlords. Interest on both short-time loans and mortgages is included, and all direct taxes—real, personal or income. The sources of the data used for the estimates presented in this table cover a considerable range of both governmental and private or semi-private agencies. The methods of estimate used were in several instances quite indirect and space does not permit of their description here.

TABLE 1—GROSS AND AVAILABLE CASH FARM INCOME
(Years beginning July 1—In millions of dollars; i.e., 000,000 omitted)

	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
Gross sales[1]	5563	5628	5478	5721	5910	5948	6502	8298	12268	13766	14105	10754	7462	8956	9580	10336	10615	9995	10322
Sales to other farmers[2]	643	657	628	668	679	657	696	794	1021	1137	1284	886	584	737	734	752	726	725	700
Net sales	4920	4971	4850	5053	5231	5291	5806	7504	11247	12629	12821	9868	6878	8219	8846	9584	9889	9270	9622
Interest and taxes[3]	560	584	620	657	700	750	842	925	1040	1278	1581	1713	1710	1666	1690	1660	1652	1629	1629
Available cash	4360	4387	4230	4396	4531	4541	4964	6579	10207	11351	11240	8155	5168	6553	7156	7924	8237	7641	7993
Wages paid[4]	717	715	755	760	785	765	780	845	1055	1245	1492	1730	1088	1061	1204	1207	1216	1238	1240
Balance[5]	3643	3672	3475	3636	3746	3776	4184	5734	9152	10106	9748	6425	4080	5492	5952	6717	7021	6403	6753

[1] Gross sales represent the total of cash received by individual farmers or farm owners for products sold.
[2] Sales to other farmers are grain, hay, livestock, etc., grown by one farmer and sold to another. This item is substracted from gross sales to determine net sales which is the total cash income of agriculture considered as a whole.
[3] Total interest and tax payments of all farm owners and operators are subtracted to show the amount available for expenditures and savings by the farm and farm-owning population.
[4] Wages paid are payments for hired labor as estimated by the National Bureau of Economic Research (1909-18) and United States Department of Agriculture (1919-26). Our own preliminary estimate for 1927.
[5] The balance represents net cash receipts of farm owners and operators—not, it should be noted, net income.

TABLE 2—GROSS FARM CASH INCOME, BY SECTIONS[1]

(Years beginning July 1—In millions of dollars; i.e., 000,000 omitted)

Year	*Corn Belt*	*Wheat Belt*	*Eastern Dairy Belt*	*Western Dairy Belt*	*Eastern Cotton Belt*	*Western Cotton Belt*	*Tobacco Belt*	*Range States*	*Pacific Coast*
1909-10	1436	709	570	483	736	608	282	216	300
1910-11	1353	588	608	477	794	729	265	219	341
1911-12	1375	569	627	498	708	627	236	214	378
1912-13	1347	698	646	504	717	800	266	252	398
1913-14	1464	628	663	548	861	770	276	262	390
1914-15	1482	813	686	533	623	653	273	278	445
1915-16	1533	899	712	570	729	750	292	337	485
1916-17	1938	1092	906	731	1009	1264	414	444	637
1917-18	3057	1432	1086	1060	1449	1649	625	586	728
1918-19	8416	1753	1226	1301	1824	1538	667	725	937
1919-20	3311	1591	1266	1291	1969	1953	697	619	1002
1920-21	2388	1275	1073	1058	1306	1374	568	539	877
1921-22	1661	806	861	760	866	777	375	395	703
1922-23	2056	1005	925	895	1155	1118	458	451	748
1923-24	2108	958	951	960	1243	1402	474	497	809
1924-25	2272	1392	953	1028	1243	1566	472	528	725
1925-26	2326	1198	1078	1093	1386	1397	464	590	888
1926-27	2274	1054	1031	1053	1199	1276	464	552	889
1927-28	2135	1290	1039	1025	1321	1351	490	642	904

[1] States in the above sections are—Corn Belt (5 States): Ohio, Indiana, Illinois, Iowa, and Missouri; Wheat Belt (4 States): North Dakota, South Dakota, Nebraska, and Kansas; Eastern Dairy Belt (9 States): New England, New York, New Jersey, and Pennsylvania; Western Dairy Belt (3 States): Michigan, Wisconsin, and Minnesota; Eastern Cotton Belt (7 States): North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, and Tennessee; Western Cotton Belt (4 States): Louisiana, Arkansas, Oklahoma, and Texas; Tobacco Belt (5 States): Virginia, West Virginia, Maryland, Delaware, and Kentucky; Range States (8 States): Montana, Wyoming, Idaho, Utah, Colorado, Arizona, New Mexico, and Nevada; Pacific Coast (3 States): Washington, Oregon, and California.

Sections do not foot up exactly to United States totals as they are totals of State figures which are derived from slightly less complete statistical data than those reported for the country as a whole.

TABLE 3—LEADING ITEMS OF FARMERS' EXPENDITURES—1927

(In millions of dollars; i.e., 000,000 ommitted

Feed and livestock from other farmers	700
Interest	739
Taxes	890
Implements	525
Harness	75
Fertilizers	135
Mill feeds	485
Automobiles	1200
Total	4749

THE MIGRATION TO TOWNS AND CITIES. IV[1]

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Previous studies have developed the following theories concerning the intermigration between urban areas and 700 farms in Minnesota.[2] Migrants from farms to cities enter the lower classes in the greater percentage of the cases. These data agreed with those of Otto Ammon which are presented as an exception to the theory of George Hansen that rural migrants enter the city middle class in a large proportion of the cases.[3] Children of the successful farm families stay on the farms more often than the less successful. These children, when they do migrate to urban areas, rise in the social scale more rapidly than children of the lower income farm families. Large industrial cities are greater agencies for non-proportional selection than are towns and villages. The migrants from the cities to these farms came primarily from the artisan class. Their economic ability, as shown by incomes and living expenditures, was about equivalent to that of native farmers. They had more schooling than native farmers. Two-thirds of them took up farming because they intermarried with farm children. The comparison of net migration between cities and farms by economic and social groups suggested a principle of net rural-urban social selection: *the cities attract the extremes while farms attract and hold the mean strata in society.*[4] No attempt was made to generalize these principles to any other than the sample although there are good

[1] This is Paper 768, Journal Series, Agricultural Experiment Station, University of Minnesota. Previous studies concerning this same problem are numbers I and II by Zimmerman, in the American Journal of Sociology, November, 1926, and July, 1927, and number III by Zimmerman, Duncan and Frey, American Journal of Sociology, September, 1927.

[2] These 700 farms were those included in rural-living studies by the Minnesota Agricultural Experiment Station during 1925 and 1926. They include 13 samples from the major farming areas of the State. See Minnesota bulletins 234 and 240.

[3] For data concerning these earlier theories as to the selective influence of cityward migration see G. Hansen, Die Drei Bevolkerungsstufen; Otto Ammon, Die Naturliche Auslese, and Histoire d'une Idee; and G. V. de Lapouge, Les Selections Sociales. A summary of this controversy is given in A. F. Weber, Growth of Cities in the 19th century; W. Z. Ripley, The races of Europe, ch. 20; F. H. Hankins, The racial basis of civilization, ch. 10; P. A. Sorokin, Contemporary sociological theories, ch. 5. The best is Historie d'une Idee.

[4] Dr. Leon E. Truesdell has suggested this same distribution of migrants in the theoretical introduction to "Farm population in the United States," Census Monograph VI, Washington Gov't Printing Office, 1926.

reasons to believe that they are true for Minnesota and to some extent for that main type of agriculture predominant in the northern part of the United States and Canada in which rural proletariats or wage earners are a minor and insignificant group. Furthermore, data gathered by the rural-urban intelligence testers in New England, New York, Northumberland and the Isle of Wight do not prove the contrary.[5] The study by Ashby and Jones in Carmarthenshire gives some further supporting evidence.[6]

For the purpose of this present study, materials are presented from the 1927 study of incomes, expenditures and budgetary behavior of about 400 village and town families in Minnesota. These families represent samples taken during the summer of 1927 from 11 of the towns and villages around which these 700 farm families, already discussed, live. They were gathered for the purpose of comparing living conditions of village and town families with those on adjacent farms. Each family was asked to give the occupation of the father of the male and female parents and the present occupations of all children who had found their life work.

These 11 villages and towns varied from approximately 750 to 7,000 in population and represented various types of the agricultural village. The smaller were stationary villages, whereas the largest represented towns becoming urbanized and growing rapidly. Table 1 gives the sizes, number of families included, and average incomes and expenses of these families.

Table 1 divides the families under consideration into the various villages and towns. Within each location an attempt was made to sample as carefully as possible the various social and economic groups. The following methods were used. Two workers spent five or six days in each community. The first two or two-and-a-half days were

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[5] See E. E. Windes, U. S. Bureau of Education Bul., 1925, No. 6; M. E. Haggerty and Harry R. Nash, Journal of Educational Psychology, Vol. 15, 1924, Pp. 559 ff.; James Duff and Godfrey Thompson, British Journal of Psychology, Vol. 14, 1923-24, pp. 192 ff; Hector MacDonald, British Journal of Psychology, Vol. 16, 1925-26, pp. 123 ff. Henry Sée gives some further data for Ireland following the years of famine (1855-46) and for England following the inclosure acts. See Esquisse d'une histoire du régime agraire en Europe aux XVIII et XIX siecles. Pp. 96 ff. and 117. Some of his other writings give similar indications for France.

[6] See A. W. Ashby and J. Morgan Jones, The social origin of Welsh Farmers. Welsh studies in agricultural economics, No. 3, 1926, pp. 10 ff.

spent in the poorer section of the towns, visiting the wage earners, (unskilled, semi-skilled, and skilled). The following two days were spent in an average district and families of the middle class such as clericals, small business men and small professional men were interviewed. The remainder of the time was spent among the upper classes, the big business and higher professional groups. The aim was to

TABLE 1.—NUMBER OF FAMILIES INCLUDED IN THE STUDY, WITH PRELIMINARY SUMMARY OF AVERAGE INCOME AND EXPENSE PER ADULT EQUIVALENT
(These estimates are for the 12 months preceding July 1, 1927.)

Location	*Population 1920*[1]	*Families Included*	*Average Income per Family*	*Average Expense per Adult Equivalent*[2]
	Number	*Number*	*Dollars*	*Dollars*
1	742	35	1705	476
2	934	25	2588	822
3	1006	40	2463	731
4	1080	37	2876	884
5	1772	24	1850	595
6	1871	39	1537	601
7	2111	35	2535	744
8	2463	39	2521	706
9	2790	36	2397	778
10	6825	42	2532	981
11	7086	43	2698	910
All		395	2353	733

[1] Census of 1920.
[2] All families were reduced to the adult equivalent for food consumption in order to reduce differences due to ages, sizes and sex composition. See Minnesota Bul. 234 for a discussion of the method. Expenditures per adult equivalent are the best single index for comparing the economic standing of these families. With the exception of number 5, where the size of the sample is small, it is believed that these averages are approximately close to the general conditions.

get a representative sample of each occupational group whether or not the data were typical of the towns and villages under consideration. It is the belief of the field men, who were highly experienced at this type of work, that these data are fairly typical of all communities except number 5 and of most of the occupational groups included.[7] Table 2 presents the occupational groups found in these communities, the number included in each group, and the average

[7] The field work was done by D. C. Dvoracek, Minnesota Extension Specialist in Marketing, and C. C. Zimmerman. They were assisted in various communities by O. D. Duncan, Fred C. Frey, Elmo H. Lott, Mignon Quaw Lott, and C. Arnold Anderson. All of the latter with the exception of Mignon Quaw Lott were instructors and graduate students in sociology at the University of Minnesota.

income per family and expense per adult equivalent for each group. These incomes and expenditures are preliminary estimates and have not been checked for minor errors.[8] The only differences between these groupings and those of Taussig and Barr are that the upper ones are split into higher and lower classes, and widows, spinsters, and retired farmers are considered separately. Of course these groupings are relative to the villages and towns under consideration and not to large cities. The primary difference lies in the business and professional groups.

TABLE 2.—OCCUPATIONAL GROUPS, WITH AVERAGE FAMILY INCOMES AND EXPENDITURES PER ADULT EQUIVALENT

Group	*Families*	*Percentage of whole group*	*Average income for the year*[1]	*Expense per adult equivalent*[2]
	Number	*Per cent*	*Dollars*	*Dollars*
Widows and spinsters	18	4.5	948	427
Retired farmers	32	8.1	1358	609
Laborers, unskilled	41	10.4	919	279
Semi-skilled	46	11.6	1496	422
Skilled	41	10.4	1879	570
Clerical and managerial employees	78	19.8	2658	779
Small business (incomes under $3000)	58	14.7	1949	576
Small professional (incomes under $3000)	25	6.3	2379	839
Large business (incomes over $3000)	37	9.4	5332	1683
Large professional (incomes over $3000)	19	4.8	5698	1804
Total and average	395	100.0	2353	733

[1] Net spendable family income from all sources.
[2] Expense for all purposes such as food, clothing, housing, health, organization, incidentals, investments, savings, etc.

Table 2 shows that if the special groups of widows, spinsters and retired farmers be omitted, the remainder, with the exception of the clerical and managerial groups represents a progressive climbing of the economic and social ladder. The clerical and managerial employees seem somewhat better off than the small business groups. Many of them are well paid and hold fairly high positions in the community. However, these groupings will suffice in a

[8] The survey method was used. A double check system was introduced so that errors of estimate were discovered and eliminated on the ground. No claims as to the specious accuracy of any of these data are made.

rough way as a measure of the quality of the population for purposes of comparing their relations to agriculture. The struggle for social position is from the lowest to the highest. Various detailed studies have proved that this social ladder operates as a sieve so that the upper groups are, on the average, of better quality mentally, physically and socially than the lower.[9]

Each head of a household reported his place of birth and whether or not he had resided on a farm at any time during his life. Omitting the retired farmers, widows and spinsters, the following in Table 3 is given.

TABLE 3.—PER CENT OF HEADS OF HOUSEHOLDS IN VARIOUS OCCUPATIONAL GROUPS BORN OR HAVING RESIDED ON FARMS

Occupational Group	*Heads of households*	*Born on farm*	*Lived on farm*	*Born on farm*	*Lived on farm*
	Number	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Unskilled	41	72.5	85.0		
Semi-skilled	46	66.0	78.7	62.2	74.2
Skilled	41	46.5	58.5		
Clerical and managerial	78	48.7	64.1	48.7	64.1
Small business	58	66.7	60.2		
Small professional	25	52.0	60.0	54.5	63.5
Large business	37	44.4	58.6		
Large professional	19	42.1	57.9		
All groups	345	56.0	67.6	56.0	67.6

If this table be interpreted by itself it appears that the majority of heads of households residing in the agricultural villages and towns in the Midwest are children of farmers and two-thirds of them have resided on farms. *In other words, the agricultural village and town primarily represents a division of labor among farming people themselves.* Further, with the exception of the small business men the higher groups appear to have less relationship to agriculture than the lower groups. The differences are slight as should be expected from the previous studies in this series. Nevertheless, they exist, they are fairly consistent and large enough to indicate real differences. Other students of the origin of similar groups of population have inter-

[9] See the detailed proofs of this in various chapters of Sorokin's "Social mobility" and his "Contemporary sociological theories." G. Hansen's theory was that there were two main groups in a society, the landowning peasants and the city proletariat. These intermediate groups merely operated as a sieve to waste the population by a rigid selection and elevation of the more fit to high social positions where they failed to reproduce themselves.

preted such differences to mean that farmers are devoid or lacking in leadership ability due to the migration of the better classes to the cities.[10] However, three factors must be taken into consideration—the equality of persons who leave farms; the social inheritance of the occupation of the father; and the fact that farmers may enter urban life at the bottom of the ladder and social climbing is not completed in one generation.[11]

The inheritance of the social class of the father is brought out in Table 4.

TABLE 4.—SOCIAL ORIGIN OF HOUSEHOLDER AND WIFE

Occupational and social class of head of household	*Persons*	*Occupation of male parents of man and wife (percentage division)*				
		Farmers	*Laborers*	*Clerks and managers*	*Business and professional*	*Total*
	Number	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Laborers (all kinds) 256		61.3	32.4	1.2	5.1	100.0
Clerks and managers 156		54.5	25.0	4.5	16.0	100.0
Business and professional 272		53.3	23.9	2.9	19.9	100.0
All classes 684		56.6	27.3	2.7	13.4	100.0

It appears in this table that all classes are related more to agriculture than to all other groups. Next in importance for laborers is their own class. Farming and their own class combined account for 93.7 per cent of all laborers. The middle group is from farm families, laboring families and the business and professional class. Their economic position is above the small business group. (See Table 2) The business and professional group come from the households of farmers, laborers and their own class. The only outstanding characteristic of this table is that few of the upper class families have fallen into the laboring groups whereas many children of laborers have risen. This factor may be due to the migration to cities of those who have fallen in social status from the upper groups. Further, social selection in villages and towns is but a part of larger

[10] See Macy Campbell, "Rural life at the crossroads." About thirty studies of the rural or urban origin of elite classes are in existence. These deal with most of the prominent persons in Western society since A.D. 1000. These will be summarized and analyzed in a forthcoming volume by Sorokin and Zimmerman, "Rural sociology", H. Holt and Co., 1929.

[11] This study does not show this conclusion as others which measure the total migration from farms and not just to villages. Large urban units are the greatest agencies for non-proportional selection.

forces of selection which are bound up with the complete processes of urbanization. The inheritance of social class is not as prominent here as in many other studies for different societies and for classes involving greater economic and social differences.[12] The small percentage following the occupation of the parents in the clerical and managerial group is due to two factors—it itself is a transitory stage through which the lower groups are climbing to the upper, and, second, it is an occupational group of fairly recent appearance in the agricultural village.[13]

TABLE 5.—RELATIVE CONTRIBUTIONS OF FARMERS AND LOWER CLASSES TO THE TOTAL VILLAGE AND TOWN POPULATION COMPARED WITH THEIR RELATIVE CONTRIBUTIONS OF THE SOCIAL CLIMBERS WHO REACH THE UPPER GROUPS

Occupation of male parents of householders	*Total of these*		*Percentage distribution*	
	in villages and towns	*who have reached upper class*	*All in villages and towns*	*All in upper class*
	Number	*Number*	*Per cent*	*Per cent*
Farmers	387	145	65.1	66.5
Laborers (of all kinds)	187	65	31.7	29.8
Clerks and managers	18	8	3.2	3.7
Total	592	218	100.0	100.0

In order to eliminate differences in the upper class which Table 5 is computed to show the relative contributions the farmers, laborers, and managerial groups make to the business and professional class. This table gives the relative contributions of farmers, laborers, and the managerial groups to the total village population compared with their relative contributions to those social climbers who reach the business and professional classes.

Table 5 shows that farm children show as much ability as the lower classes of the villages in their relative ability to climb to the upper (business and professional) class now arise from the facts that a considerable proportion of the upper classes are children of former occupants of that class, resident there. If allowance be made for the psychological

[12] See Fritz Mass, Op. Cit., note 14, for data as to inheritance of class. Also the works of Sorokin cited.

[13] This clerical and managerial group does not represent the store clerks of ordinary terminology, but rather that class of higher functionaries who manage businesses for other persons. The ordinary store clerk does not occupy an economic or social position in these towns and villages higher than semi-skilled labor.

handicaps of changing from rural to a semi-urban environment and the migration vertically up the social ladder in one generation, farmers probably have more real ability than is shown here. Many other studies bear out this conclusion whether measured from the mental, physical, moral, or economic standpoint.[14] This table does not bear out the popular belief concerning the lack of ability among the migrants from farms. In spite of inadequate early training, their rapidity of social climbing is as high as among the other groups in the villages.

TABLE 6.—DISTRIBUTION OF OCCUPIED CHILDREN OF VILLAGE AND TOWN FAMILIES

Occupation of householder	*Occupied children*		*Percentage distribution by occupation*					
			Farmers	*Unskilled*	*Skilled and unskilled*	*Clerical and managerial*	*Business*	*Professional*
	Number	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Widows and spinsters	39	11.3	41.0	2.6	28.2	5.1	10.3	12.8
Retired farmers[1]	75	21.8	37.4	12.0	17.3	9.3	14.7	9.3
Unskilled laborers	55	16.0	27.2	20.0	31.0	14.6	3.6	3.6
Skilled and semi-skilled	38	11.1	7.9	13.2	29.0	26.3	5.3	18.4
Clerical and managerial	51	14.8	2.0	0.0	17.6	35.3	31.4	13.7
Business	52	15.1	13.5	7.8	26.9	21.1	17.3	13.4
Professional	34	9.9	2.9	0.0	14.7	29.4	14.7	38.3
Total	344	100.0	20.6	8.7	23.3	19.2	14.2	14.0

[1] The fact that 25 per cent of the children of retired farmers are already in the upper groups does not conflict with the previous statement that farm children generally enter urban life at the bottom of the social ladder. Farmers who retire to towns are not representative of the total group but are biased toward the more successful.

Each household furnishes information as to the number of children who had found regular employment away from home and the types of occupations followed by these children. Table 6 presents an analysis of that material.

An interpretation of Table 6 must be made on the basis of the fact that these occupational groups of the children are merely tentative. All of them have not yet found their level. Some will rise and some will fall in the future; but,

[14] These studies will be summarized in Sorokin and Zimmerman, Op. Cit. See especially, Fritz Mass, "Ueber die herkunftsbedigungen der geistigen fuhrer," Archiv fur Sozialwissenschaft und Sozial politik, Vol. 41, 1915, pp. 141-186; Visher, S. S., "A study of the place of birth and the occupation of fathers of Sketches of Who's Who in America," American Journal of Sociology, Vol. 30, 1925, pp. 151 ff.; and Sorokin, P. A., "Leaders of labor and radical movements," American Journal of Sociology, Vol. XXXIII, No. 3, Nov., 1927.

the chances are that more will rise than fall. All groups are rising and falling at a rapid rate reflecting an extreme mobility in Western society. However, the upper classes contribute more to the upper classes than the lower and vice versa. This may be expected on the basis of previous studies. Of the upper groups, the one which is maintaining itself best is the professional. This probably is the result of a higher degree of selection for professionals than for the other groups to be found in these towns and villages. *The real aristocracy of the town and the village is probably composed of a greater proportion of professional men than in cities.* Some of this is due to the presence of medical men in the villages and some to the limitation of opportunities for large business incomes due to the relatively smaller clientele.

Widows and retired farmers send more children to agriculture than any of the other groups. (In many cases these are widows of retired farmers or widows who moved to the villages at death of active farmers.) Unskilled labor and the business group also contribute sizeable proportions to the farming class. *These data suggest the previous conclusion that migrants to agriculture are not materially lower in ability than native farmers.* Of course, the group from which recruits go to agriculture is never an indication of the ability of the individual. But the fact that retired farmers and the business class make large contributions is an index of some of the better types selected. Furthermore, many of the children of laborers have shown ability to rise in the urban social ladder as well as on the agricultural.

Conclusions

This paper presents further data on migration and social selection based on partial records of three generations for about 400 families now living in 11 Minnesota towns and villages. They indicate that village and town families represent, to a large extent, a division of labor among farm families because two-thirds have been farmers at one time or another. Thus an important factual basis for permanent Town-Country antagonism does not exist as far as these records show. The mobility of these families up and down

the social ladder and from farm to town and vice versa is extremely high. (This may be due in part to the newness of Minnesota). *They do not bear out the conclusion that farmers are declining in native ability due to the migrations of a select group to towns and cities.*[15] However, the sample is limited and the relationships are so complicated, that we can not claim that they give any real proof to the contrary. It is suggested that the professional families, primarily the medical men, form the real economic and social aristocracy of the agricultural towns and villages.

[15] This conclusion differs partly from those drawn by A. B. Hill in "Internal Migration and its effects upon the death rates," Medical Research Council, special report series 95, London, 1925; and Livio Livi, "Emigrazione ed Eugenetica," delivered at the Primo Congresso Italiano di Eugenetica Sociale, 1924, University of Rome. Hill reaches the conclusion that internal migration has been harmful to the rural population. His data consist of rural and urban variations in death rates by age groups. But data from many other countries do not support this theory. Further, the physical comparisons, already referred to, do not bear this out. Livi, basing his study upon demographic characteristics of Italian provinces with greatest emigration abroad and cityward, concludes that oversea migration has not been harmful because the diseased could not return. On the other hand, he claims that internal migration (urbanization) has been harmful to rural districts becaused the diseased return. Hill, however, proves the contrary for England. All this goes to prove that our theories of selective migration are doubtful, and adds validity to the net migration theory suggested at the beginning of this paper. This problem of the qualitative phases of migration should be investigated by some of the Purnell workers in rural sociology. See Agricultural Situation, April 1, 1828, p. 23, for a suggestion of dysgienic selection, but no proofs.

THE MICHIGAN LAND ECONOMIC SURVEY[1]

WADE DEVRIES

MICHIGAN STATE DEPARTMENT OF CONSERVATION

Michigan began its statehood with 35,000,000 acres of virgin forest, and 1,500,000 acres of prairies or other untimbered land. By 1890, Michigan was the leading lumber exporting State. But by 1922, when the Land Economic Survey was inaugurated, only about one-tenth of the original forest area remained uncut and only from 1 to 30 per cent of the area of the northern counties was in cropped land. In southern Michigan as in the neighboring States of Ohio and Indiana, the land was logged off in small-scale operations by the farmers in the process of preparing their land for cultivation. In northern Michigan, the timber land was in large holdings and it was logged off by lumber companies in large-scale operations. Large areas of cut-over land were then thrown on the farm land market. Northern Michigan problems were, therefore, different from those of the older southern part of the State. Farming development had not kept pace with the axe of the lumberman in the northern counties. The area in farms was actually decreasing and the area of idle cut-over land was increasing. It was generally estimated that about one-third of the area of the State was idle land, i.e., land that was not producing any income for the owner to recompense him for paying his taxes. Many of the owners had been holding their idle land for as much as 40 years in the hope that it would eventually be made into farms. According to the Michigan laws, the title in land reverts to the State after being in a condition of tax delinquency for more than 5 years. In northern Michigan there was a large amount of land that had come to be considered so worthless that the owners refused to pay taxes on it and more and more of this land was being deeded back to the State on account of non-payment of taxes. The State now owns about a million acres of this type of land. As a result of idle land and tax delinquency, 15 counties were found to be less than 50 per cent

[1] This paper was read at the eighteenth annual meeting of the American Farm Economic Association at Washington, D.C., December, 1927.

self-supporting, and 40 of our 83 counties were less than 100 per cent self-supporting, i.e., they were receiving a subsidy, principally in the form of school and road money, from the more prosperous southern counties. It is agreed that the children of the settler on the pine plains of Michigan are entitled to as good an education as the children of the duplex and apartment house district of Detroit. It was realized that northern Michigan was no longer in the pioneer stage of development. It had been open for settlement for 40 years, and more, and was not yet definitely or certainly moving toward the self-supporting stage. It seemed that the automobile factory towns were to be required to contribute to the support of the northern counties for some years to come. For this reason, the more wealthy portions of the State had a financial interest in the future possibilities for development in the northern counties. As a business proposition many people in the State felt that there was an urgent need for an inventory of the resources of northern Michigan.

Of course, northern Michigan is not an unexplored wilderness. There were many influential people who had a lifetime acquaintance with conditions in the northern part of the State. Some said that the agricultural possibilities of this section had hardly been touched. All of the cut-over and timber land was potential agricultural land, and all that was necessary was to get right-minded farmers and teach them how to farm in northern Michigan. Others, equally well informed, said that nearly all of northern Michigan was unsuited to farming development and would have to be used for forest production or nothing. Still others said that by divine providence northern Michigan was made and intended only to be a wilderness, a recreation ground for the people of the industrial centers of the State. Thus, particulars were taken for generalities. There was felt to be a need for more facts which would reconcile the divergent views, and which would provide a foundation upon which to base a policy in regard to the utilization of northern Michigan lands.

For the past six years the Michigan Land Economic Survey has been engaged in accumulating the facts upon which

to base a policy for the future development of northern Michigan's resources. This is being done by making a detailed inventory of those counties in which tax delinquency and idle land are common. A little more than four million acres have been surveyed up to date.

A detailed soil survey is made according to the standards of the United States Bureau of Chemistry and Soils. In addition to what is shown on the standard soil map, we show by an overprint the "lay of the land" in five classes: level, gently sloping, moderately sloping, strongly sloping and hilly. A forest and farm land survey is made showing on the map the exact location of the different timber types, the degree of stocking and the prevailing diameter of the trees. The cropped land, cleared pasture, stump pasture and idle or abandoned land are also shown. An economic survey is made which will be discussed in more detail later. A water power and geological survey of each county is made at the same time as the soil, forest and farm land, and economic surveys.

Each division of the Land Economic Survey reports facts only. We avoid the terms agricultural and non-agricultural. We do not attempt a land classification. If we secure and present only the facts in regard to land, no one can question our fairness or the authority with which we make our statements. We do not dedicate any land to farming use or to forest production or to any one of the hundreds of forms of land use. We present facts only, but in such a way that the person having a certain land use in mind can select the conditions best suited to his need. To illustrate I will read from the Ogemaw County soil legend:

"Kewaunee Loam: Gently rolling gray-brown loam on reddish compact pebbly gritty clay. Surface soil prevailingly acid. Deep subsoil high in lime. Moderate to high natural fertility. Good natural surface- and under-drainage. The red clay subsoil holds moisture and fertility well. The unimproved land is slightly to moderately stony. Cultivating the steeper slopes may cause surface washing or erosion. Over most of this soil, however, 'washing' is not serious. Well represented by the rolling loam on red clay farmlands of the Campbell's Corners Community. Original forest growth mixed hardwoods (hard maple, yellow birch, beech, elm, basswood, hemlock) with some scattered large white pine. Over 90 per cent cleared for farmland. The bulk of Ogemaw County's choicest and most highly developed farming land is on this soil. Practically no idle or abandoned farmland."

"Grayling Sand: Level gray-brown rather coarse sand on deep yellow gravelly sand. Soil and subsoil acid. Under-drainage free and rapid. Low in natural fertility. Free from stone. Like the Foster Township Dry Sandy Jackpine Plains. Present forest growth patchy stand of jack pine, oak or poplar, with 'Plains' grasses and sweet fern in the open areas. Less than 5 per cent cleared for farmland. Fully 80 per cent of the land once cleared and used for farmland on this soil is now idle and unused."

If a prospective farmer is looking for land he can take his choice of these soils. We have given him the facts only, and have expressed no opinion as to which soil is best suited to his particular needs. So also in the forest and economic maps and reports, we present facts only, but when they are presented in such a fashion, remedies and policies are apparent to the open minded and unprejudiced.

The Land Economic Survey has been organized in order to provide maps and an inventory of the resources of northern Michigan. We are held to a stated schedule of map and report production and so cannot be a research organization. Many interesting problems are suggested in our work, which we would like to see followed to a conclusion. We are glad to turn such problems over to graduate students of the State University or Agricultural College. We are able to furnish such students with our maps and reports and often no additional field work is necessary on their part in order to pursue their research study.

The Michigan Land Economic Survey is a division of the State Department of Conservation and is supported by a direct appropriation from the legislature. The permanent staff of the survey is made up of six persons: the director, the land economist, the staff forester, the staff soil surveyor, the staff draftsman, and a stenographer-clerk. In addition to this staff, the field party includes ten soil mappers and ten forest mappers. One forest mapper and one soil mapper traveling together make up one field crew. The ten field crews work out from one camp. Two of the soil mappers or soil surveyors are furnished us by a co-operative agreement with the United States Bureau of Chemistry and Soils. The soil classification is made and the mapping is reviewed by the Soils Department of Michigan State College and the inspector for the United States Bureau of Soils. The State Geological Survey furnishes a

geologist who works with our party and prepares geological maps and reports for the area we are covering. Our Survey hires a hydrographic engineer during the summer who makes a survey of the waterpower possibilities of the principal streams in the area being covered and reports on the same. Including the cook and cook's helper, the field crew is made up of about thirty men working out from a centrally located camp. Camp is moved every two or three weeks. With the present appropriation the Survey is able to cover about 850,000 acres annually, an area equal to two average-sized Michigan counties. The cost per acre for the field work has been about two and one-half cents; and for office drafting and map and report publication there has been an additional cost of about two and one-half cents per acre.

The economic survey attempts to collect all facts pertinent to the development and utilization of the county's resources not covered by the physical inventory of the natural resources.

First, it inquires into the nature of land ownership, who owns the land, and why they own it. We would like to know what is in the minds of the owners of the land in regard to their ownership. Any project for the full utilization of land must be carried on through the instrumentality of the owners. For this reason, it is important to know the owners' attittude toward their land ownership.

Second, the assessed valuation of every piece of real estate is obtained in order to find a measure of the relative importance of the different classes of property in contributing to the support of local and State governmental activities.

Third, a study is made of the tax rate in each local district for the purpose of correlating it with the other economic factors and with the physical inventory of each district as made by the soil and forest mappers.

Fourth, a study is made of the county's industries and production. Carload shipments received and forwarded from each local freight office are obtained and recorded by commodities. From a study of rural mail routes, roads, road conditions and topography, we are able to map the

general trade area served by or serving each village or shipping point. With this information at hand we are able to correlate the nature and quantity of commodities shipped with the physical conditions of soil and cover and culture in the area from which they originate.

In all phases of this economic inventory we attempt to correlate the economic data with natural districts as interpreted by soil, drainage, topography and forest cover (See Fig. 1). These correlations are nearly always shown in map form. Our data are presented in such a way that by a little study any interested individual can readily see the causes and reasons for conditions without the necessity of a personal interpretation being given by the Survey's staff.

In conducting the economic field work there was no precedent to follow in working with such a Survey as this. The field work the first year was more or less experimental. Many sources of information appeared, from time to time, promising; many projects proved to be too laborious for the results obtained and were discarded. Some sources of information available in one county were unavailable in other counties. Most of our field procedure, however, is now quite definitely established.

An up-to-date map of land ownership in each township is prepared from the records of the Register of Deeds or from the records of the private abstractor. This ownership map is taken to the local township assessor, as he is the person most familiar with the plans and policies of the land owners in his district. He is asked to identify each of the land owners shown on the map. He is asked the intent of the owner in holding each parcel of land. As his attention is called to each land description, the assessor gives his idea of the intent in ownership together with a good deal of local gossip. The meat of the answer is recorded in a note book. From this interview with the local assessor it has been found possible to classify the intent in ownership into the following broad classes:

1. Farming; i.e., land that is now or has been a part of a farm. This class is subdivided into owner-operated farms, rented farms, and abandoned farms.

2. Land held for recreational purposes; i.e., lake shore cottage sites and private hunting grounds or any other land that has been definitely dedicated by the owners to a recreational use.

3. Land owned for the timber that is or was growing on it. This class is subdivided into land held by lumber companies now operating within the county, and the residual holdings of former timber operators.

4. Land held only for speculation or sale. Most of this land is owned by people who have never been residents of the State.

5. In other minor classes of intent-in-ownership are land held for water power development purposes, land held for its possible mineral resource, land held for residence purposes, and industrial and village sites. (See Fig. 2)

This intent-in-ownership obtained from the local assessor is checked by traveling practically every road. It has been found that the assessor is, as a rule, well informed and is conscientious about giving correct information. The valuation of every parcel of land is obtained from the assessment rolls and is recorded on township plats. (See Fig. 3.) An analysis of the tax rate in each local school district is obtained from the county records.

In obtaining data on ownership, valuations, taxation, industries and production, the land economist associates throughout the summer with county and township officers and the local business men and leaders. Through this association, the local bias on the future prospects of the county is obtained.

As much as possible the economic data are compiled in map form in order that they may be more easily understood and in order that they may be easily correlated with the physical resources as shown by the soil map, the farm and forest map, and even by the surface geology map.

I would state here that the procedure and objectives which we set for the Land Economic Survey were determined almost wholly by our own State requirements and those Michigan statutes which affected land and land use. It seems probable that should other States desire to initiate a survey similar to the Michigan Land Economic Survey,

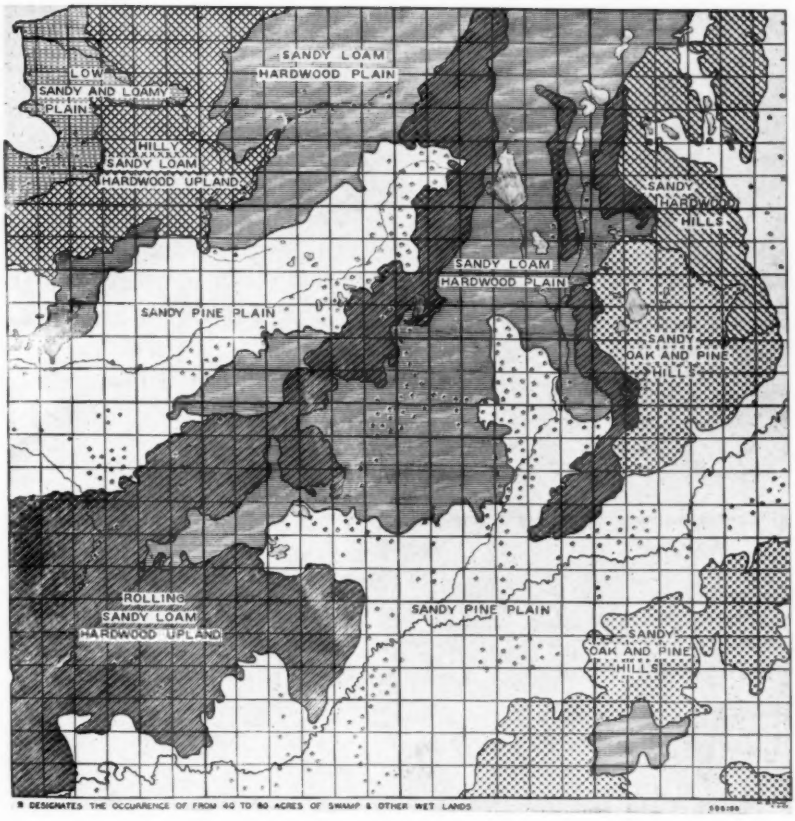

FIG. 1. NATURAL DISTRICT, KALKASKA COUNTY.
(Courtesy of Mich. Dept. of Conservation Land Economic Survey.)

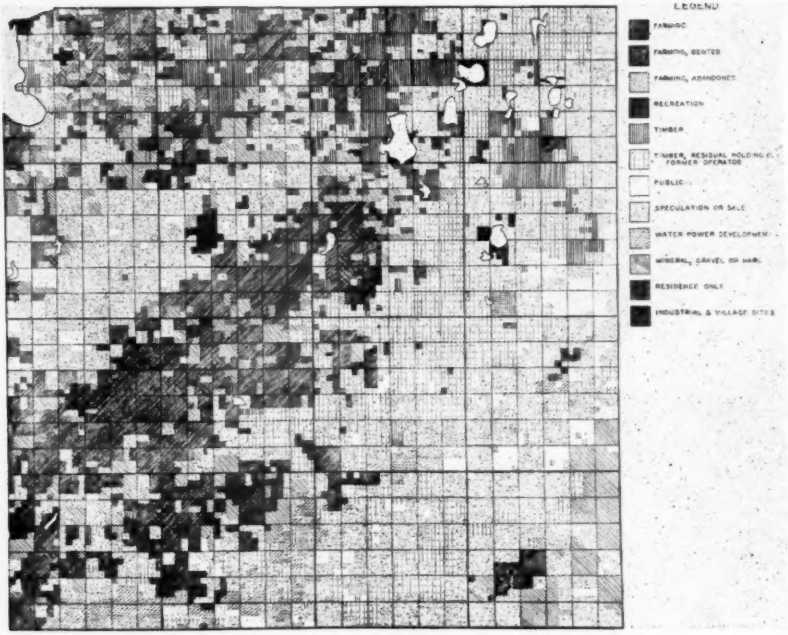

FIG. 2. INTENT IN OWNERSHIP, KALKASKA COUNTY, 1927.

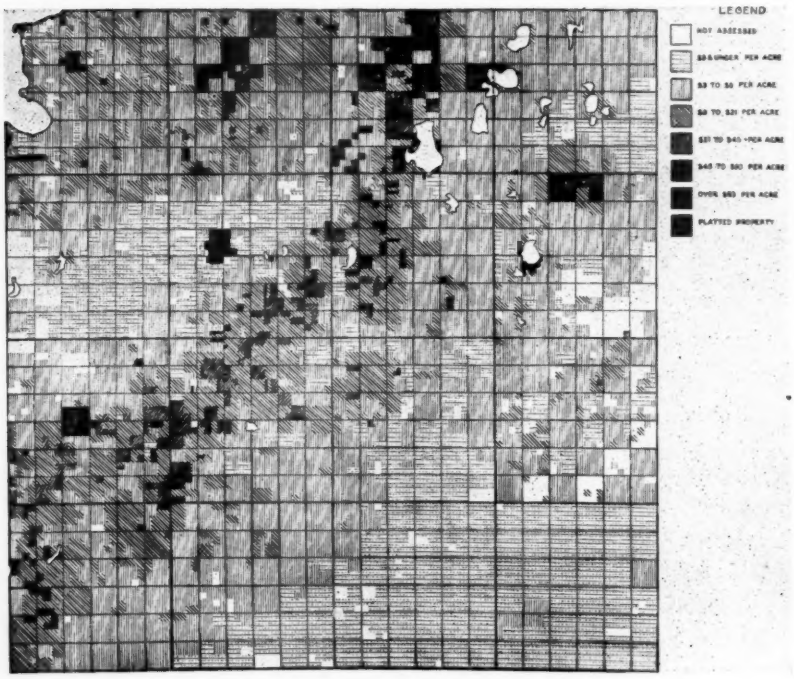

FIG. 3. ASSESSED VALUATION, KALKASKA COUNTY, 1926
(Both graphs by Courtesy of Mich. Dept. of Conservation Land Economic Survey.)

they will find that the procedure will need to be modified so as to meet the situation in the particular State.

The Land Economic Survey has for distribution to the public, in addition to the lithographed soil maps with soil and agricultural report on the back and the lithographed cover maps with forest and economic report on the back, blue-print ownership maps, surface geology maps with mimeographed geological reports, and mimeographed water power reports covering each county worked. There are also full economic reports and graphs for departmental and office use.

After the preliminary maps and reports are completed, they are presented and explained to the local people at a public meeting in the county seat. These meetings are generally sponsored by the chamber of commerce and the county agricultural agent. The local meetings that we have held thus far have been well attended and a great deal of interest in the maps was manifest. After the meeting we endeavor to have a local organization or committee appointed to make use of the inventory and to see that it is available to those who have need of it.

The Survey's data can, of course, be used in a great variety of ways. As is true of any new tools, the public was at first hesitant about using our maps and data. Within the last year, we have had a large call for our publications. During 1927, we had over 300 personal requests for maps and other data on the counties covered. I will cite just a few examples of how the Survey has actually been used to date.

The county agricultural agent in one of the counties was experimenting with a new type of under-drainage. As he found it was successful on a particular soil he could unhesitatingly recommend it on those areas where the same type of soil was mapped.

A representative of a Canadian pulp company was interested in locating lands on which pulp timber might be cut at this time. He was also interested in acquiring lands on which pulp timber might be cut in from five to thirty years, lands which could be purchased at a reasonable price, and lands that were close to water transportation. He

spent about a week in our office looking over our maps of the eastern part of the Upper Peninsula. This pulp man had been in the Upper Peninsula looking over land and conferring with large land owners there, but he did not see land that would fit all of his requirements until after he had studied our maps.

The State of Michigan is interested in establishing game preserves. In the selection of sites for game preserves, it is desirable to avoid any interference with future agricultural expansion. A study of the Land Economic Survey maps by those in charge of game preserves has helped them in locating the most desirable sites for such preserves, where swamp and upland cover and water are in the right proportions and are suited to provide protection for game. I have in mind many other ways in which our maps and reports have actually been used, many of which uses were not contemplated when the Survey was inaugurated.

The goal of the Michigan Land Economic Survey is to provide an inventory of the resources of northern Michigan upon which may be based a plan, or many plans for the profitable use of every acre of land.

RESEARCH AS A BASIS FOR AN AGRICULTURAL POLICY AND PROGRAM [1]

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We might begin by asking what an agricultural program is and how it differs from an agricultural policy. A great deal has been written about both in the last few years and numerous agricultural programs have been laid down for certain States and regions.

I might define the term "agricultural policy" as a definite economic philosophy, tacit or formulated, which is to be kept in mind as a guide to action with reference to agriculture. An agricultural program, on the other hand, would consist of a series or a succession of steps to be taken to carry out the established policy. For example, the policy of a given farmer may be to:

1. Aim to live in reasonable comfort and to pay for his farm over a long period rather than to concentrate his energies on rapid cancellation of debt.
2. Maintain fertility of soil.
3. Provide a reasonably full year's program of work.
4. Allow time in his program of work for attention to marketing.

It is, of course, assumed that he seeks the highest annual net income obtainable with the energy he is able and willing to put forth. His actual program would then include such steps as the following:

1. Arrange financing on long-time basis (refinancing, if necessary) on some amortization plan.
2. Select the most promising group of enterprises consistent with personal inclinations and the above points of policy.
3. Seek to combine them in the most profitable proportions as changing price conditions and prospects dictate.
4. Develop the best possible market connections consistent with his ability and with the time he may arrange to devote to marketing.

[1] Presented at the second annual meeting of Western Society of Farm Economics, July 7, 1928, Berkeley.

The State or region is, of course, made up of individuals grouped by communities. The regional program must therefore include steps designed to promote individual and community welfare. But what is best for one or a few individuals or even communities may not be best for an entire region or State. Thus in one region squabs were once very profitable to a few individuals but rapid expansion in production soon made them an unprofitable product for all. Cling peaches have been profitable to most of those who grew them, but are now unprofitable to most of the many who now grow them. There must then be a balance between peach production and production of other commodities. This will require (1) that some men produce only peaches and others produce only certain other things (individual specilization) or (2) that some men produce peaches and several other things (individual diversification) or (3) that there be a combination of the two situations. The precise extent to which each of various products will be produced will be determined by individuals on the basis of individual decisions—the trial and error method. Each method may be best for certain instances. In some communities where conditions are comparatively favorable to the production of given crops or products, there may be both individual specialization and community specialization. Even in the latter case there will very likely, however, be a degree of community diversification—a few men in a fruit section may, for example, engage in dairying to supply local milk needs.

But what can the State do in the way of research to facilitate the laying out of a program for orderly development toward increased general welfare? Assuming that there is already a fairly high degree of agricultural development the State should organize its research program with a view to—

(1) Pointing out trends toward broad general adjustments or maladjustments in the relative growth of specific agricultural industries. (See, for example, Bulletin 452, California Experiment Station, Economic Aspects of the Pear Industry, and other studies of this sort). The peach grower or the dairyman needs to know price and production trends. Each should know both the immediate and the

long-time outlook before he can make intelligent decisions. In fact, he needs not only these but also price trends of the more important cost elements—supplies, wages, equipment —before he is in position to decide upon expansion or curtailment. No regional program can be laid out without such knowledge if it is to involve either expansion or curtailment. Lacking knowledge, men act on random guesses as to the future. By knowledge of price and production trends I do not mean merely a tabulation and charting of a few price and production series, but information as to factors which are causing the trend to change both within a State and without. Moreover, this material needs to be kept up to date. It is the five, ten and twenty year outlook that is needed for program development. An impossible job? Perhaps. But the individual and the community must look ahead. Can we help them by developing both tools and technique?

(2) Obtaining and organizing data needed by the individual in testing out and determining upon his own organization in the light of the general situation. Any regional program requires a research background of what we might call individual operating data. If the regional program involves any kind of shift—more or less of any present crop or product, or a new crop replacing some other on present farms—consideration must be given to the way in which the change works out. A few years ago I heard a whole afternoon's discussion on diversification unwind itself without anything more definite than that the dairy industry was a good one and should be expanded. One could not even gather from the discussions whether community diversification or individual diversification was the objective. Obviously, those formulating a regional program should have a background of just the sort of data the individual needs to organize his own enterprise. For example, (a) what is the amount and seasonal distribution of labor and equipment needed on the individual farm for peach production, dairying, or for other enterprises which might in whole or in part be substituted? (b) what are the yields per acre or what is the production per animal under various farm conditions and for varying feed, fertilizer, and labor inputs?

(c) what is the optimum size of enterprise for various situations and enterprise combinations?

(3) Ascertaining possibilities of removing stresses where these exist and of general improvement at any point. There is a group of problems which are faced by any community or region the moment it seeks to lay out a program for the improvement of market conditions. Take such a specific product as grapes. The California grower last fall was said to get $30 a ton while the New York consumer paid $240. A rough approximation of the various intervening charges and margins has been made and explains the disappearance of practically all of this percentage price spread of 87½% of the consumer's dollar. It is interesting. But what about reducing the spread? At each step there is room for a detailed study of the reason for the market situation at that particular stage. Thus there is the packing stage at country points, the distributor stage, the transportation stage, the wholesaler or auction stage, the jobber stage, the retailer stage. We need to know more about market structure and functioning in the produce trade. Why are the present trade channels followed? Are present facilities adequate or sufficiently "modern"? What are the reasons for certain commodity combinations? What is the influence on (a) cost and (b) price of (1) the lengthening or shortening of trade channels by introducing new units or eliminating existing units by more direct dealings? (2) combining units by an integration process? (3) various commodity combinations? (4) size of the business unit? What can be done toward laying out a marketing program without detailed studies on such points as the above?

What is the nature of the demand for specific commodities? Does the consumer know grapes? Will more attractive appearance increase demand? Why has the sale of processed cheese climbed by leaps and bounds? Because of advertising or because of the way the new product itself appeals to people? How is demand for a specific commodity related to the demand for other commodities? Is the demand for walnuts affected by the price of almonds? of peanuts? of pecans? What is the influence of trade practices and attitudes on demand?

What are the main sources of supply of the region? Is it feasible and desirable to replace distant sources with near-by sources? Upon what grounds? How accomplish the desired result?

How do prices behave? Why? We have numerous large cooperative associations. A study of the price policies of many of these quickly leads one to a conviction that the welfare of entire regions might be improved by more accurate knowledge of price behavior.

British Columbia has just embarked upon a distribution and surplus control scheme for fruits and vegetables and has a commission studying the dairy industry with a view to drafting a dairy surplus control plan for the Frazer Valley. It will most certainly need information on price behavior as well as producers' response to price before an adequate scheme can be worked out.

Any State or regional program is certain to be affected by any national program that may be adopted. For over seven years the air has been full of "farm relief". Here is the way some of the questions have presented themselves. Shall we have some sort of national farm relief? If so, what sort? The McNary-Haugen type? The export debenture type? Horizontal tariff increases? More and better credit? More agricultural engineering? Corporation farming? Better marketing? Control of annual and seasonal surpluses by enormous cooperatives? Efforts to move the less successful farmers to the city? Development of by-products manufacture or other industries for rural communities?

Or, take another slant at the problem: What is wrong with agriculture anyway? All prices fell. Why did some fall so much farther than others? Why have some manufactured products remained higher than farm products as a group? Decreased demand? Replacement of horses by tractor, truck, and auto? Mistaken land development policy? Inefficient production? Too little use of machinery? Too little technical efficiency? Too high a tariff on supplies and equipment used in agricultural production and consumption? Taxes too high or badly distributed? Excessive bonding for schools and other public buildings? Speculation

in land? Excessive increases in imports in recent years? Or is the whole "agricultural depression" a delusion, the result of too much psycho-analytical introspection, as some persons would have us believe?

Just how much more efficient are farmers now than they were ten or fifteen years ago? Is increased efficiency, as a matter of fact, at the bottom of the continuance of the agricultural unrest? In December of 1923, the late Henry C. Wallace, then Secretary of Agriculture, speaking before the Farm Economic Association, said:

> ".... In times such as these the problems of farm management on most farms are reduced to the simplest terms and can be stated very briefly. For example, produce as much as you can and as cheaply as you can of what you can produce best; spend as little as you can; do without everything you can; work as hard as you can; make your wife and children work as hard as they can. Having done this, take what comfort you can in the thought that if you succeed in doing what you set out to do, and if most other farmers also succeed, you will have produced larger crops than can be sold at a profit and you will still be under the harrow. . . . ."[2]

How much truth is there to this statement? Mr. Wallace was not the first to utter it. Nor the last.

These questions cover about the whole field of agricultural policy—land policy, tariff policy, taxation policy, forest policy, transportation policy, immigration policy, policy with reference to the support of research, with reference to the support of gathering statistical information, such as the census and crop reporting services, support of regulation of private business by governmental agencies, and so forth. But how many of us can give the answers to the above questions? I think this group would at this moment agree on the answers to only a few. The group might find itself in the position of two boys who were arguing at the dinner table about the height of a fence surrounding a baseball diamond. Their father finally ended the argument by stating that the subject was not a matter for argument and

[2] JOURNAL OF FARM ECONOMICS, vol. VI, p. 2.

he instructed the boys to "measure the fence." I believe we have some fences to measure. But first we have still to construct some measuring devices—basic statistical data of usable accuracy and scope.

We need, for example, research in land utilization for the establishment of land utilization and forest policy, and, in particular, for the establishment of a sound tax policy with reference to farm property. We need studies of the effect of immigration policy on agriculture in the various sections of the country. Thus far our national policy on all these points has been developed largely on the basis of a tug-of-war between various regions or interests. One region wants the development of certain agricultural areas. Another does not want them developed. One region puts up a special request for lower freight rates. Another objects, but later comes for a reduction in its own freight rates to help it meet the competition of the first region.

The "average man" in a protectionist country does not consider economists to be clear thinkers on the tariff question—otherwise they would not so generally be free-traders. I think I am safe in saying that most of them are free-traders at heart—*as an ideal policy*—but that few of them are free-traders *in practical policy.* Most agricultural economists agree that an effective tariff on agricultural products cannot be of value to farmers for more than a single generation. After most farms have changed hands under an effective tariff régime its benefits will have passed into other hands through the transfer of lands at enhanced values. We shall, however, undoubtedly have even higher tariffs—perhaps even some form of "McNary-Haugen Act", if certain planks in both major party platforms mean anything. It may seem like a long look ahead to visualize the United States as substantially a free-trade country. But such a situation is not without the range of possibility if our manufacturing industries continue to grow and the city vote continues to increase in proportion to rural vote. Should a shift to a free trade policy occur within the next generation it might be well to have at hand a few good tariff studies to show *how much of our agriculture would be ruined by tariff removal.*

I wonder if a carefully correlated research program is not in order, since many of the problems we have suggested very clearly involve State and regional policy as part of a national policy. Certainly no national policy could be established and no national program worked out without considering the regional or State effect of such a program. Our research workers must work toward the development of a body of fact, an understanding of broad relationships that will give them the confidence and interest of our farm leaders and of public men generally.

The following outline suggests a designation of fields for a division of agricultural economics to provide the most serviceable organization for coping with the economic problems of a State. The field may be divided as follows:

1. Land economics, including land settlement and development, land value, land appraisal, land tenure, tenancy, and public land policy.
2. Farm management and organization. Studies of the organization and operation of farms; combination of enterprises; size of farms; labor and capital requirements; landlord and tenant relationships.
3. Agricultural industries, divided into three main groups: (1) livestock, (2) fruits, and (3) field and truck crops. Studies of the long-time outlook, of shifts and trends in specific industries, of price behavior, and of special problems arising from time to time.
4. Agricultural finance, including such subheadings as farm credit and credit institutions, market financing, financing of rural institutions, and taxation of farm property. (The last might be a separate field.)
5. Transportation and traffic. Traffic routes and rates, influence on regional development.
6. Marketing and market organization. Studies of marketing agencies, their organization and operation, movement of goods through them; advertising, branding, trade and consumer preference.
7. Rural social problems, including population movements, social aspects of rural labor and tenancy, community development, and rural recreation.

This grouping should, of course, be looked upon as flexible. In experiment stations with small departments of agricultural economics one man may work in two or more of the fields. In other cases, there may be two or more men in some. Just what grouping is adopted may depend somewhat upon the size of staff and its training and experience.

The following reasons may be given for this grouping:

1. It gives opportunity for development of specialists intimately familiar with the major fields of work and the literature which has become voluminous.
2. It develops or brings into the group the several kinds of technique necessary to modern research. Price behavior, farm organization, marketing, finance, land economics, transportation, rural sociology, all require a special technique for the most effective selection, collection, and analysis of data.
3. It provides a knowledge of the commodity necessary to the understanding of its economic problem. The man who studies the price behavior of a commodity and who continues to work with it even intermittently develops a familiarity with it that is often lacking in such groups as ours.
4. It develops for the group the greatest possible number of trade and professional contacts and entrees with a minimum of duplication.

Our groups need to make and maintain more contacts. The market specialist would have an intimate and wide acquaintance with marketing men and would be familiar with their field and its problems. Similarly, the other specialists would know their respective fields, their problems, and their personnel.

There would, of course, have to be a good deal of intradivisional cooperation. In fact, there would doubtless be few problems that would not require such active cooperation. At all times there should also be the closest cooperation with other divisions. Here, then, would be an economic clinic for agriculture. In health it would serve to maintain health. In illness it would diagnose the trouble and prescribe a remedy. Is this too ambitious a goal? Not if we make the most of our opportunity.

THE WORK OF THE STATES IN ADAPTING ANNUAL FEDERAL OUTLOOK REPORTS[1]

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As to content most outlook reports have to do with forecasts of production, of price, or of both. Outlook reports of either kind may be subdivided according to the amount of time elapsing between the forecast and the event forecasted, for the purposes of this paper, into annual outlook reports and long time outlook reports. This paper is concerned only with certain aspects of annual outlook reports.

In California in 1927 the crops and enterprises involving an annual commitment had about one-half the farm value of those involving a longer commitment.

ESTIMATED FARM VALUE OF GROUPS OF ENTERPRISES—CALIFORNIA, 1927

Groups Having Annual Commitment		*Groups Having Long-time Commitment*	
Enterprise	*Farm Value*	*Enterprise*	*Farm Value*
Field crops	$166,341,000	Tree and vine crops	$220,221,000
Vegetable crops	64,158,000	Livestock products	217,807,000
	$230,499,000		$438,028,000

The most important single source of annual outlook reports is the Federal Bureau of Agricultural Economics. These Federal outlook reports give a picture of changes that are expected to take place in either United States or world-wide supply and sometimes indicate the United States price that it is expected will be associated with the forecasted supply. But whether it be the supply or the national price that is forecasted it may be said that the national outlook reports need adaptation before their greatest usefulness for any State can be realized. In recognition of this fact, a considerable number of States now publish State outlook reports in which an attempt is made to translate the national outlook into a State outlook that has direct significance for local problems.

The viewpoint which will be maintained in developing the main topic of this paper is that of the ultimate consumer

[1] Read at the second annual meeting of the Western Society of Farm Economics, Berkeley, California, July, 1928.

of outlook reports—the farmer. An attempt will be made to visualize his needs, his capacities for using these reports and his reactions to these reports.

What a Farmer Wants from Outlook Reports

This will depend to a large extent upon the kind of farming he is engaged in or has a chance to engage in. But at least one generalization may be made that applies to all farmers; they are not interested in a forecast that bears upon a decision which they do not have. Stating the principle in positive terms it may be said that a farmer will only benefit from a forecast the content, form, and time of release of which is such that he can use it in arriving at some decision which he actually has it within his power to make. This involves subjecting current objectives in the designing of State outlook reports to two tests, namely:

a. Does the average farmer to whom the outlook report is sent actually have the power to make the decision upon which the report is supposed to throw some light?

b. Does the outlook report throw as much light upon the decision as it might under present conditions? If not, what changes may be made.

Important Annual Decisions for a Farmer

A farmer may or may not have it within his power to decide upon:

a. the direction and amount of a commitment.
b. whether to sell or to hold.
c. whether to hold over into a new crop season.

It is obvious that in cases in which a crop or enterprise has practically no competition for the use of the farmer's resources an outlook report bearing upon the amount of the commitment would have relatively little value to him. There are large areas in many western States in which wheat is practically the only product that can be profitably produced.

The farmer may or may not actually have the decision as to whether to sell or to hold depending upon whether or not the given product.

a. Has the physical characteristics necessary for storing. This may vary from year to year in the case of some products.

b. Must be sold before a later and larger crop comes on the market. An outlook bearing on the question of whether or not to store Idaho early potatoes would be meaningless because they must always be marketed before the heavy movement of late potatoes starts.

c. Is financed or is marketed through an association in such a way that the growers do not have it within their power to decide when to sell.

d. Has available the necessary storage facilities.

The decision as whether to sell non-perishables or to hold them over into a new crop year is, in some respects, a separate decision from the last one (d). A new set of price factors is involved. Here again, all farmers do not always have it within their power to make this decision due to consideration similar to those already mentioned.

It is submitted upon the basis of the above considerations that an outlook report should not necessarily cover all the important agricultural products of a State. Those to be omitted may be determined in the light of local conditions.

Subject Matter of Outlook Reports

It is admitted that this section sets up as the objective for State outlook reports a goal which is impossible of complete attainment. Its excuse is that it is believed that a statement of the ideal is of value as a guide in arriving at the best possible utilization of present data and as a guide in planning new programs of research.

The farmer's goal in deciding upon the amount and direction of the commitment is the highest profit combination of crops and enterprises for his farm. A complete set of figures bearing upon this problem would include:

a. The prospective prices of all the competing products he can produce.

b. The prospective unit costs of each.

The cost factors dealt with in outlook reports can include only those which have a market price since it is not possible to deal statistically with other kinds of cost factors. Unit

costs in the cases of crops will be determined by the prospective prices of the cost factors used and upon the yields per acre. The majority of the data needed in making this decision are therefore local prices, present and prospective.

The decision to hold or to sell during the crop year requires first, a forecast of the trend in price after harvest, and second, a knowledge of probable loss in storage. Here again, the most important data needed have to do with prospective price.

The decision whether or not to hold over into another crop season requires a forecast of stocks held over, production the coming year, and resulting price. The price is the thing the farmer desires so that he may compare it with the price he can get at the present time. In addition he would need to know loss in storage.

We live in a price economy. The farmer, like other people, thinks in terms of price. Most of his decisions can be made on the basis of prospective prices. An outlook which stops with a forecast of production leaves it to the farmer to translate the indicated production into an indicated price. Obviously, the farmer is not as well equipped for this job as are trained economists and statisticians. It is therefore submitted that annual outlook reports should include not only a statement of prospective production but also a statement of probable effect of this production on local price.

Possible Improvements in State Outlooks

A. In the case of outlooks prior to the commitment where annual commitments are involved and where a forecast of national production is furnished by the Federal Bureau of Agricultural Economics the most obvious improvement in the State contribution would be to show what has been the historical relationship between national production and *local* price over a representative period of years. Of what benefit to the farmer is it to know what the national supply will be unless the local price related to that supply is also known? This change in State outlook reports would be in the nature of an adaptation to local use. No actual forecast of a specific price need be made.

But the farmer is interested in prices and should at least be given two columns of figures—the national production including the forecasted production in one and the associated local price opposite. It would be well to instruct him to add a third column in which to enter the actual price he received in each of the listed years. No new statistical technique and no extensive research is necessary to make this change in the content of State outlook reports.

B. Another change which is in most cases possible under present conditions would be to divide the State into districts each of which would have a more or less homogeneous type of agriculture. This could be built up from the personal knowledge of agricultural workers if it is not available from statistics. For each of these districts the crops and enterprises that are important competitors for the use of the farmer's resources should be determined. For each of these districts there should be written an outlook report which would organize the price, and other forecasts for each of the competing crops and enterprises in that district into a meaningful picture for that locality. At the very least the price forecast on the important crops and enterprises in that district could be brought into juxtaposition. In addition any factors which can be forecasted or which are already known to affect the yields of these crops in that locality should be tied up with the prospective price situation. Such factors might be the visible supply or irrigation water already impounded; the prospects for a good or bad year due to pests insofar as this can be forecasted, etc. Such a picture should be of more value to the ordinary farmer than the same data presented from the state-wide standpoint and organized around commodities instead of around districts.

C. Another change that might be made would be to omit from outlook reports all non-outlook material. Anything that can, with equal relevance, be said every year is not outlook material. Such material is usually concerned with production practices. The presence of such material confuses rather than clarifies the discussion of the prospects for the coming year.

D. Lastly, crops or enterprises concerning which the farmers of the State do not have any of the above important decisions should be omitted from the list of commodities covered in the State outlook report.

New Research and Facilities Needed

The next step is to bring into the outlook reports the factors, other than production, which affect the price, and to show the relative importance of price-determining factors. This necessitates more elaborate research, the use of more advanced statistical methods and in some cases the use of statistical series which may be more difficult to get than those used in present outlook reports.

The research most needed as a preliminary to any considerable progress along the line of price forecasting is the compilation of reliable price series. This work is already going forward in many State and Federal institutions. It is believed that a worthwhile addition to this work would be to accompany such price series with price histories. By price histories is meant a condensed record of trade gossip concerning the supposed reasons for marked changes in prices. Such price histories would give the price analyst a very valuable set of leads to investigate when attempting to determine the factors affecting a given price. Such price histories are best compiled when the events depicted are still market news. It is believed that agencies now collecting price series could make these series of much more value to future users if brief notes of the above nature were appended.

Another need is a means of preserving statistical data once they have been collected, and of making them available to the public. It is believed that every large State should have an index on agricultural statistics relating to production and marketing. We already have extensive library facilities but for the most part their contents are not indexed in such a way as to show readily the available statistics in any given subject.

THE PATERSON PLAN AND AUSTRALIAN BUTTER PRICES

P. F. Brookens

Bureau of Agricultural Economics

The Commonwealth of Australia has a surplus of butter each year varying widely with changes in conditions affecting production. This surplus, fluctuating between some 20 and 50 per cent of the output in any seasonal year, and selling chiefly in English markets, has the effect normally of maintaining Australian prices for the entire output at "London parity" or at the equivalent of the net London price.

Beginning with January 1, 1926, and continuing to date (September 1, 1928), a very definitely established shift in price relationship is indicated by available data as between the local prices in Australia and the London prices of Australian butter with a material margin since that time in favor of the former.

The shift was simultaneous with the coming into operation of the Paterson scheme, administered by the Australian Stabilization Committee and its advisory state committees organized by Australian producers for that purpose. Under this system, Australian butter producers voluntarily assess themselves on all butter produced in order that, through compensation to exporters of butter, the domestic prices will automatically rise by the amount of such compensation or "bounty" with a net gain resulting to the dairy industry as a whole.

Although the payment to exporters is referred to as an export bounty, its purpose, it should be carefully noted, is not that of the encouragement of exportation as such. On the contrary, the existence of a comparatively small surplus in each season since the inception of the plan has tended to increase the profitableness of control, since the smaller the export the lower the levy upon producers necessary to raise the price of the total output by the amount originally fixed in the agreement among producers under the Paterson plan.

In the 1925-26 season, for example, approximately one-third of the butter produced in Australia was exported. In that year a levy of 1 penny per pound on all butter manufactured would have created a fund about sufficient (aside from expenses of administration) to pay the bounty of 3 pence per pound which can always be claimed on any butter exported. But since the two-thirds going into domestic consumption would automatically realize an additional 3 pence per pound, the gain to the butter producers as a whole would have been 2 pence per pound, which is just about the amount of gain reported by the Stabilization Committee for that year.

In the following season when the output was still more seriously affected by drought, it is estimated that not more than 20 per cent was exported. The bounty on the surplus in that year was thus provided by a proportionately lighter levy, although no official statement of actual costs and gains is yet at hand. During the five-year period, 1922-26, a bounty of 3 pence on every pound of butter exported could have been provided by a levy of 1.075 pence on each pound produced, according to an estimate made by Mr. Paterson. Generally, the levies are made sufficiently heavy to allow a safe margin over actual needs in paying the bounty, and the reserve is later prorated back to suppliers. The maximum levy in any recent year would have been 1½ pence or about 3 cents, since in no year have the exports exceeded 50 per cent of the output. The bounty was maintained at 3 pence or about 6 cents, as originally fixed, until September 1, 1928, when a new rate of 4 pence (8 cents) went into effect.

Three pence per pound was the amount claimed by Australian butter producers when the scheme was being formulated in 1925, as representing, on the average, the difference between their costs of production and the prevailing prices realized on the basis of London parity. These costs, it was maintained, are materially increased by the numerous measures that have given protection in the home market to other branches of Australian industry, and accordingly, the basic industry of agriculture is entitled to some measure which would afford those engaged in it the same protection

of the home market as has already been given to labor and the secondary industries.

While the commonwealth government of Australia took the position that it had no authority to enter into such a matter, it left the way open for any movement in that direction to be inaugurated by producers themselves on a voluntary basis. Through the cooperative creameries as agents of the producers, support was secured for the inauguration of the plan which became effective January 1, 1926, with some 90 per cent of the Australian butter output under contract for the first year.

The successful operation of the scheme appears to date to have been disturbed chiefly by two obstacles, both of which have been dealt with earnestly and more or less effectually. One of these difficulties is involved in the matter of interstate sales in which one State may be able, by taking advantage of temporary conditions, to quote their butter at less than the theoretical all-Australian price based on London parity plus the bounty. Conferences in which the State committees, each of which deals generally with all matters pertaining to administration within its own State, have met with the Commonwealth committee have not as yet been able to do away with certain inequalities in prices actually obtained throughout the Commonwealth. That the general level of price is successfully maintained at the higher level aimed at by the export bounty payment is confirmed, nevertheless, by a development that constituted, for a time at least, the other chief obstacle to the plan. New Zealand butter interests were enabled to export profitably to Australia over the tariff wall under the reciprocal tariff arrangement then existing. Effective June 15, 1928, this tariff was raised from 2 pence to 6 pence per pound, which will effectually remove this threat to the voluntary cooperative protection by Australian dairymen of the Australian butter market.

AGRICULTURAL ECONOMICS IN RUSSIA

A. Tchayanov

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The interest in Russian art and science which is becoming so general in Europe and America could well be extended to incl Russian economics. A knowledge of Russian economic life would help the economists of Europe and America not only to understand the Russian agricultural economy, but also that of eastern Europe generally and particularly that of Asia with which it has much in common.

Economists outside of Russia will be surprised to learn that agricultural economics has been studied here for more than two centuries. Our first original treatises belong to the time of Peter the Great, to the very beginning of the XVII century, when Kotoshihin wrote his well-known treatise "On Poverty and Opulence," and a few years later Volynsky wrote his "Instructions Concerning Agriculture," addressed to the steward of his estates. In 1737, appeared the first translation of "Florian's Economy," published with notes applying to Russian conditions; and at the end of the XVII century we find a number of renowned agronomists and economists, headed by Bolotov, Blankennagel, Komov and others, publishing special magazines and writing thick volumes, which even now, well-bound in leather, adorn the bookshelves of our libraries.

An interesting chapter in Russian agricultural history relates to an effort made at the beginning of the last century to introduce English agriculture into Russia. The instigator was Arch-priest Simbirsky, then attached to the Russian embassy in London. Farmers were called from England, English machines were imported, and our market overflowed with books on English farming. Something in the nature of a pilgrimage was organized to visit "Kagoul," an estate near Moscow, belonging to Count Ruminzev, where an Englishman (Rogers) had obtained unheard-of technical successes. Finally, Count Rastopohin, he who burned Moscow in 1812, had an obelisk placed on one of his

estates in honor of Arthur Young. But most of these European inventions, introduced into Russia, could not economically compete with the customary practices of Russian farming, based on the forced labor of an enslaved peasantry; they were therefore gradually rejected.

With the abolition of slavery, in 1851, and the establishment of the Zemstvo local self-government, the interest of economists turned toward peasant farming. Most of the Zemstvo governments established special statistical bureaus, whose task was to carry out with the greatest exactitude all kinds of research in peasant farming, and to give accurate and detailed accounts of millions of separate farms. It is quite beyond doubt that no other country has such an extensive collection of local statistical monographs as Russia has. We know of more than 3,000 volumes of such local statistical studies of different kinds. Whole generations of agricultural economists have grown up on the knowledge of this research work and have studied its results. They have worked under the direction of such teachers of agricultural economics as Ludogovsky, Skvorzov, Fortunatov and Kablukov,—names perhaps unknown to western Europe, but which will ever live in the memory of their Russian disciples.

Russian economists have also been greatly encouraged in their studies by the works of Yermolov and Lenin, to whom we are indebted for two eminent works on the development of capitalism in an agricultural economy.

The Theory of Peasant Farming

It will be impossible to enumerate all the lines of economic thought which have grown out of these records and the researches of these men. Let it suffice to present two of them, the theory of peasant farming, and the theory of localization of production.

The theory of peasant farming was developed by Professors Kossinsky, Tchelinzev, Makarov and the writer of this article after many years of study of the extensive statistical materials of the Zemstvo and their detailed accounts of thousands of peasant farms in European Russia. Here land-owning is based on village community principles.

This study has brought us to a realization of the numerous peculiarities connected with the organization of farming enterprises and the mode of farming adopted by our peasantry, from which a special theory has been evolved, which we have come to call the theory of peasant farming.

The essential features of this theory will appear in the following description. The peasant farms of Russia differ from American farms and from the proprietors' estates of Germany and of pre-war Russia not so much in size as in the absence of hired labor. The Russian peasant farm has no wages to pay, it works on the labor of its own household, and therefore can be considered as "household agricultural economy," like most of the farms in India, Japan, China and other non-European countries. In so far as "household economy" has no hired hands—under the conditions existing in the Eastern countries—the sizes of holdings vary and are inclined to change through apportionment by the community and through short-term rents, according to the amount of labor available in the household, roughly according to the size of the family and ages of its members. The amount of work accomplished by it may be determined exactly by the number of its working members and the intensity of their work. In so far as such a household pays no wages, its net-income cannot be actually defined; only the gross income can be calculated. Having deducted from this the amounts needed to cover the out-of-pocket expenses, the remainder goes to the requirements of the working household and is the payment for its work (Arbeitverdienst as E. Laur calls it).

The balance between work and needs is the outstanding feature of such an economy. The economist's idealized balance of utility of goods and disutility of effort is thus realized in large measure. The amount of the resulting income is defined by a natural balance of the essential needs and the amount of work required for their satisfaction. The needs of the household stimulate the members to earn as much as possible by working. However, in all relatively equal conditions, the amount earned is in proportion to the number of members of the household.

What happens under such a system when there is an in-

sufficiency of land and means, can easily be imagined. The family is forced to seek other employment for its unoccupied hands to satisfy its requirements in full; and this often takes the form of hardest toil. Thus, when there is an insufficiency of land, the peasant household striving to enlarge its holdings has to pay exceedingly high rates for the lease and purchase of land, rates which surpass the rates of revenue and land capitalization. They begin to grow the most unprofitable crops (flax for instance), if only these crops—needing as they do a great deal of labor to one unit of area—can help to increase the yearly income, on the same insufficient holding, and this may cause the household much additional hard toil at the lowest rate of reward per day. Moved by the same considerations, the peasants also take up various industries, bartering the resulting goods at a fabulously low rate. For the years of bad harvest, we often find high prices for grain, and at the same time small wages being paid in industry, and low prices being paid for squirrels (furs), the shooting of which is one of the peasants' outside occupations. The peasant household, being unable to keep up a proper balance between work done and family requirements within the limits of the farm, offers its labor power at any price offered for it for the sake of increasing its yearly income. This throws light on the economy of the eastern agricultural countries.

The Theory of Localization of Production

The vastness of Russia, and the extreme range in the climate—from the polar swamps to the subtropical areas of the South—have obliged the economists and the public administrators of Russia to divide the whole country into agricultural regions, each having a specific economic structure. This work was started at the end of the XIX century by Richter and Skvorzov; but it has developed most intensively during the last ten years. With the publication of the brilliant work of Professor A. N. Tchelinzev, "Agricultural Regions of European Russia as Phases of Evolution," even the smallest areas of separate governments and districts began to be investigated (the work of E. N. Knip-

ovich, N. N. Nikitin, A. A. Kotov, B. L. Brook, N. Ziplenkov and others).

In connection with this immense work, a considerable body of theory of agricultural geography has developed. This theory relates to the variations in prices and in intensity of agriculture according to distance and transport conditions relative to local consuming markets and the largest world consuming areas. If we draw a line from one point of an area to another having the same level of prices for any particular product, we call it an "isotimon line" (the line of equal prices). According to Von Thünen, systems of farming are determined by prices; hence along one and the same isotimon line, there should be, theoretically speaking, the same system of farming. And as each system requires a definite amount of labor, each isotimon must indicate its own particular density of rural population, which will be the same along the length of the line. But the "theoretical" density of rural population does not follow invariably the isotimon line, since the latter is influenced by variations of climate and soil, which affect the crops, the income and the very system of farming.

Also, in most cases, the actual population is not the same as in theory; we find regions over-populated from the theoretical standpoint, and others which are sparsely populated. According to the above theory of peasant farming, in regions overpopulated with rural workers, crops requiring much labor are mostly grown, the income is comparatively low, as are also the wages of the workers on the peasant farms; home-industry and various additional crafts are developing, and land values and the rent on land are relatively high. On the other hand, in regions with an inadequate rural population, economic conditions are just the opposite.

Usually, we can observe in over-populated regions a tendency to migrate to less-populated areas, and of regulating by this means the number of people in conformity with the theoretical level. Owing to the rapid changes of market conditions, however, and to the natural increase of population, the usual disproportion remains, and practical politicians of agricultural countries have to reckon with it.

The transition of a country from "natural economy" to the trading structure invariably leads to an increase in the disproportion between the theoretical density of population and the actual density. This increase of disproportion, which engenders a whole range of social-economic collisions, has been developing during the last ten years in Russia, and most probably, also in certain regions of India and of the Far East.

Organization of Agricultural Economic Research

Besides the subjects already mentioned, the studies of Russian economists are directed to problems of economic organization, the most favorable size for a farming enterprise; the determination of the quantitative efficiency of land-organization, of farm buildings; the regulation of labor in farming; the calculation of the prime or out-of-pocket costs of farm products; all questions connected with calculations of value in farming; the theory of agricultural cooperation; the organization of mechanical contrivances (tractors) and in general the introduction of machinery in farming; the question of electrification and so on, the mere enumeration of which would take up too much space in the present article.

The above-mentioned scientific activities are united in special scientific institutions, the most prominent of which are: (1) The Agrarian Institute of the Peasant International, headed by V. A. Theodorovich, where are carried on studies on questions of agricultural policy and the political movement of the peasantry. (2) The Scientific Research Institute of Agricultural Economics in Moscow, headed by the author of these lines. This last institute is the most important of the institutions mentioned above.

The Scientific Research Institute of Agricultural Economics was established in Moscow in 1919, according to a resolution of the Board of the Timirjasrv's (formerly Perovskij) Agricultural Academy. The object of this institution is the study of agricultural economics and farm management. During the years of its existence, the Institute has gradually developed its activity and is working now in the history of agriculture, in agricultural sta-

tistics, in agricultural credits and the conditions of agricultural markets. The Institute aims to unite all scientific research work in the field, to concentrate all materials and investigations, to organize independent expeditions and research and to prepare a staff of young scientists able to work as investigators and professors in the field. It has a staff of twenty economists, about thirty young aspirants who receive three years' stipend from the Government, and a hundred other scientific and technical workers.

The Institute has a library which contains practically everything published in Russia relating to the field, and also a good collection of works on general economics, social and juridical topics. The number of books in the library will presently reach 100,000. The collection is constantly increased by the purchase of all new Russian publications relating to sciences which the Institute is interested in. The library also has a number of books and magazines in foreign languages.

In order to prepare young scientists for professorial and research work, the Institute has organized pedagogical seminaries, where thirty aspirants are trained in theoretical economics, social statistics, agricultural organization and other lines.

The Institute publishes the results of its scientific research in a series of volumes entitled "Works of the Institute." Up to the present, twenty-four have been published. The most important of these are books considering the following questions: (1) "The theory of agricultural geography," (2) "The theory of rent in peasant farming and the taxation," (3) "The theory of peasant farming," (4) The quantitative effect of land-organization," (5) "The problem of determination of the expected harvest."

RESEARCH METHOD AND PROCEDURE IN AGRICULTURAL ECONOMICS

JOHN D. BLACK

By the time this number of the JOURNAL reaches you, the "handbook" on research methods and procedure in agricultural economics probably will have been distributed. If you are thinking of it strictly as a "handbook," you will be disappointed. Neither is it a monograph, or a report, or a treatise, or a textbook. Probably it is something of all of these. It can be best discussed as a body of information about methods and procedure in research and the organization of it that the special sub-committee believed would be useful.

It came into existence in the following way: The Advisory Committee on Economic and Social Research in Agriculture met in Washington last January with the intent of making plans for a group of special analyses and reports on "scope and method" on the various sub-divisions of the field of research in agricultural economics. It was agreed at the outset that some sort of general introduction would be needed to discuss aspects of methodology, procedure and organization common to all lines of research; but most of the committee were thinking of this in terms of 25 to 50 pages. As the discussion developed, it appeared that more and more should be included in this general introduction and presented there once only, so that in the end the decision was reached to devote all the present year to this introduction, and reserve the special fields for treatment in later years. An outline was prepared and a subcommittee appointed consisting of L. C. Gray, E. G. Nourse, H. R. Tolley and John D. Black (Chairman). This committee met shortly in Washington and planned the division of work and assignments.

One of the aims of the sub-committee was to make the "handbook" a summary of all the experience which agricultural economists have had with various forms of research technique. Another was to make it the joint effort of all workers in the field. As this handbook comes to you,

it includes copy from 38 different manuscripts submitted by 33 different persons other than members of the subcommittee. This does not include actual excerpts included from perhaps 25 letters received nor information summarized from reports of over a hundred correspondents to whom general inquiries were sent. In addition 16 different other people reviewed and criticized manuscripts of sections of the handbook before they were published.

The most difficult part of the undertaking was the selecting and reorganizing of the material of the manuscripts submitted to make it fit into the purposes of the handbook. In the nature of things, the contributors were unable to visualize the handbook alike or as it stood in the minds of the sub-committee. Someone else had to supply the unity and coherence and eliminate the extraneous material and duplications. A total of over a thousand pages of manuscript, not including replies to inquiries, was reworked. The excisions were mostly of material that related to scope rather than method and of material readily available elsewhere.

Important gaps will easily be discovered. Some of these are due to oversight, more to failure of persons requested to submit promised manuscripts in time for printing, and others to intent. The committee felt that some aspects of methodology had been adequately discussed elsewhere in the recent past. Members of the committee supplied what otherwise would have been many gaps due to the first two causes. But it could not fill all of them. The chairman of the sub-committee had agreed to give only two months of his time to the job, and the other members had to filch all the time they gave from other duties.

The Social Science Research Council has provided funds to carry this work into the third phase mentioned, namely, the preparation of reports on scope and method for individual fields of research. During the coming year, the fields selected for analysis are index numbers, and credit and taxation in relation to agriculture. Considerable has already been done on the first of these three fields. Special attention will be given to scope and content, to outlining these fields for the point of view of research, and to map-

ping out the various types of research projects. Methodology will be discussed as it relates to specific projects.

The strongest wish of the sub-committee for the handbook is that it will be the means of stimulating interest in methodology. It should serve to make the readers of it "method-conscious," so that whenever they happen upon evidence as to how various methods work, or new procedures of any kind, they will want to tell the world about it, and will write a note to be published in the JOURNAL. A vast amount of significant past experience with research methods was never brought to the attention of the sub-committee. May the handbook bring it to light! Enough valuable new experience happens each quarter to fill a whole journal the size of ours. Will this come out, too?

There is also much in the handbook which should provoke disagreement, and hence much-needed discussion.

BOOK REVIEWS

Harvey Baum—A study of the Agricultural Revolution, by Edward S. Mead and Bernhard Ostrolenk. University of Pennsylvania Press. 149 pp. $2.00.

"Farm relief" is definitely one of the topics of the day and will probably continue as such for some time. "Harvey Baum" deserves attention as the expression of a "point of view" on this subject. In announcing the book the University of Pennsylvania Press suggests that the authors "reach enlightening conclusions on the prevalent agricultural ailment." Many will question this statement but still find it a "lively, provocative study", although "provoking" might be a more accurate term.

Harvey Baum is a small farmer in Bucks county, Pennsylvania, who increased his potato yield three-fold by using scientific methods of production instead of those commonly followed. After his feat has been described in the first chapter, however, he is practically forgotten in the remainder of the volume, except for the later development that should all farmers follow his lead the situation would rapidly change from chaos to ruin.

The picture of farm distress painted in chapter 2, on the plight of the farmer, is more heart-rending although less accurate than that given by most of the ardent advocates of farm relief measures, a class to which the authors do not belong, despite their conviction that "this great army of workers not only receives no reward for its investment, but sells its labor at a wage one-half that of unskilled labor in manufacturing or mining." We are told that our farmers are forced to "a sub-American standard of living, comparable to the living conditions from which our Italian and Polish immigrants have escaped"; and again that "In their income and surroundings, our farm population consists of twenty-seven million American peasants." Their "austere life and hopeless future" are contrasted with the "advantages and opportunities possessed by city dwellers." Indeed, "as a matter of fact, the farmers' advantages are limited to fresh air."

Two chapters are devoted to proving that some farmers do a better job of farming than the average or the poorest and that even at present prices some farmers are able to show a profit from their operations. Frequently, in attempting to be specific the authors betray a peculiar knowledge of practical agriculture, as, for example, when they suggest that farmers in eastern Pennsylvania keep dairy cows because "livestock production supplements crop farming" and keeps labor employed in winter.

A discussion of "Why Farm Prices Remain Low" leads to the conclusion that, "barring temporary fluctuations, the farmer cannot hope to receive a permanent increase in prices" primarily because of the "potential productive capacity" of our agriculture. In chapter 6 on "The Paradox of Scientific Agriculture" the discussion up to this point is summarized as showing that "the cause of agricultural distress is the inability of the average farmer, *with his blazing inefficiency*, to produce sufficiently low cost crops at present prices to make a living wage."[1] The mental gymnastics by which the authors

[1] Italics are ours.

arrive at this conclusion are incomprehensible to the reviewer. Ignoring this statement the authors then proceed to the conclusion that "If American farmers were generally to adopt the proven methods of scientific agriculture, the farming industry would go quickly and in the grand manner into bankruptcy." Thus within the scope of three pages we see the farmers' "blazing inefficiency" as the cause of agricultural distress and at the same time as the salvation of the industry. Agricultural workers generally may well ponder over the statement that "evidently there is no solution in scientific agriculture for the farmers' ills."

The final three chapters are devoted to "Farm Relief", political and cooperative aspects, and finally its "futility", which presumably is the enlightening conclusion referred to above. We learn that farm relief is impossible politically for "The United States is primarily an urban country. Its primary interest in the prosperity of the farmer is in the bearing of that prosperity upon the city cost of living". "While cities may consent, because of ignorance or collusion, to be victimized by the rural districts in such matters as road building expenditures, when it comes to questions directly and visibly affecting the cost of living, the rate of wages, the material well-being of great masses of city people, the majority must decide." The unfortunate thing about such inferences as included in the last statement is that many other people similarly uninformed may give it credence because of its apparently authoritative source.[2]

The authors' views on farm relief through cooperative marketing organizations are equally illuminating. They are seen as forming "combinations in restraint of trade; organizations which, by controlling supply, will enable him to exact the ultimate dollar from the ultimate consumer". The efforts of the cooperatives to provide their members with information upon which they may base more intelligent production plans in line with market requirements are considered as "somewhat along the lines employed by the Kentucky Night Riders, using, however, the force of group opinion, instead of the torch and gun". One can not but wonder why the authors did not consult the reports of the American Institute of Cooperation held at the University of Pennsylvania three years ago. Regardless of such unwarranted statements, however, the authors are no doubt justified in the opinion that cooperative marketing offers no immediate and far-reaching enhancement of farmers' incomes. The friends of cooperative marketing have persistently warned farmers against expecting too great accomplishments of their associations.

Based upon certain erroneous assumptions as to the needs of the situation the authors arrive at a formidable figure for the cost of relief. Since the farmers are going ahead and will supply the cities with ample food anyway there seems to be no reason for incurring such an expenditure. Certainly, regardless of what one may think of the questionable features of the various versions of the McNary-Haugen bill, it goes too far to say that this measure is the "same plan of restriction of production, the same scheme of forestalling or regrating which, if put into practice by any other class of the population,

[2] This idea, extended to the book as a whole, is our only justification for giving so much space to this book. Agriculturally-minded folks do need to know what city folks are thinking about, and "how they get that way." The book serves to show that for an undetermined proportion of city folks.—S. W. M.

even including organized labor, would lead very quickly to injunction, or indictment, followed by trial, fine and imprisonment.''

Tariff reduction as a means of relief to agriculture is not to be considered because its abolition would result in an industrial revolution. The agricultural revolution is regarded as a fine thing regardless of its distressing aspects for ''it should be a matter of national congratulation that the revolution in agriculture promises a reduction in the cost of living, and an advance in the real wages of the American working man.'' As if farmers are not already selling food on a relatively cheap basis! But an industrial revolution as a result of tariff reduction—that would hurt in a different place—''would precipitate an industrial calamity by violently disturbing our industrial balance, throwing out of employment great numbers of workmen, and destroying the value of vast amounts of capital fixed in the plants of protected industries''—which is just about what accompanies the agricultural revolution which is in part at least ''a matter of national congratulation''.

In fairness to the authors it should be said that there is an agricultural revolution in progress, some phases of which, though extremely painful, are inevitable. But in discussing the inevitable movement from the country to city it is both inaccurate and invidious to state that ''nothing short of nationalistic control of farm operation in the interests of an *ill-equipped, untrained, unintelligent, backward*[1] farm population will suffice to retain this population on the farm''. Those are harsh words. Are there indeed no slums in New York or Philadelphia? One should speak with care about ''the inevitable and odious comparisons of the country with earnings and opportunities of the city''. It is suggested that the authors familiarize themselves with the ''peasants'' of Iowa and Illinois, or, to make the task easier for them, those of Lancaster and Chester counties, Pennsylvania.

Jesse W. Tapp

New York City

The Bread of Our Forefathers, by Sir William Ashley. Oxford, at the Clarendon Press, 1928. xii + 206 pp. $4.25.

''What was the grain, or kinds of grain, of which was composed the bread of our ancestors in this country of England?'' Sir William's treatment of that subject brings out how intimately the subject is bound up with some of the most fundamental problems of England's economic and social history. Except for occasional suggestions, only the question of supply is considered. At the end of the book, he points out that wheaten bread evidently came quite early to be regarded as a mark of superior social position, and that as soon as that was the case, its use spread because of social ambition and imitation. In this same connection, he refers to the digestibility of food grains. Since digestibility becomes of increasing importance as life comes to be carried on less in the open air and involves less use of the large body muscles due to labor-saving machines, he concludes that ''the problem of the substitution of wheat for rye may be bound up with the degree of urbanization of a country'' and that ''one strong reason why Germany until recently has continued to eat rye bread is because it has continued so much longer than England to be an

agricultural country, and so much larger a proportion of the nation could digest it with comfort.''

To-day, the bread of the English people is made of wheat. The extent to which contemporary England is dependent on its importation was strikingly brought to our attention during the War. However, England has not always been an importer of food grains. At times, it has been an exporter. It was not until the end of the eighteenth century that wheat had become the almost universal bread corn of the people of all classes and occupations.

The available documentary material on the grain supply for the various periods of English history back to the time of the Saxons is analyzed. In the final lecture the author goes beyond his findings for each period and considers to what extent the relative diffusion in England of the two chief kinds of bread corn—rye and wheat—was due to physical and to what extent to what is called ''purely historical'' causes. In general, the commonplace with agricultural writers that rye is the crop raised on a sandy soil before it has been improved proved true. It was in places where the two bread corns were cultivated on land capable of producing both that the choice seems to have depended on the stage reached in the arts of agriculture, on the distribution of settlement, or on race migration and on conquest.

The long appendix contains material previously unprinted or accessible only in great libraries. Of the first, the most significant are the few corn certificates of the Tudor and Jacobean periods still preserved in the Record Office. A metrical English version of a jocular twelfth century attack on Norfolk is of considerable interest. Each lecture is supplemented with a long section of references and notes; these are a veritable description of the sources on the subject. The illustrations and maps add much to the value of the book.

Everett E. Edwards

Bureau of Agricultural Economics

Cost Accounting Applied to Agriculture as an Aid to More Productive Farming, by J. S. King. New York, Oxford University Press, American Branch, 1928. Pp. 182. $2.50.

During recent years we have heard a great deal about the uses and limitations of data obtained through farm accounts. Much of the discussion as to limitations has centered around the determination of product costs. On the uses' side, method of substitution and farm budgeting are familiar terms. ''Cost Accounting Applied to Agriculture'' is a contribution along this line by one who has been associated with accounting work in England and Scotland for a number of years.

Professor King, in presenting his own views, has summed up in an instructive way the viewpoint and the more significant arguments of those in this country who have discussed from time to time the limitations of data showing product costs. On the constructive side the philosophy stated and method of attack suggested are in line with the philosophy and methods of those in this country who talk about trial and error, method of substitution and farm budgeting.

The book consists of three chapters. Chapter III is divided into two parts, hence the material is divided into four sections. Accounting data are discussed from two viewpoints, that of the farmer and that of the research worker.

Chapter I is devoted largely to a statement of principles, a description of the farmer's problem and to an exposition of the limitations of data showing product costs for a given farm when used by the farm operator as a basis of future operations. The usefulness of data showing quantitative production relations as contrasted with data showing product costs is emphasized. The importance of a thorough understanding and full records of conditions prevailing on the farm and of records showing price changes is pointed out.

The sequel to Chapter I is Part I of Chapter III in which the ways the farmer may use accounting data for his own farm in improving his farming business are discussed. The viewpoint here is suggested in the following:

"In the case of the farmer seeking to make his activities more profitable, the practical questions may be simply to determine whether one method of carrying on the work of the farm is more economical in cost than another, or within what limits of price one possible alternative in production may be more profitable than another, or how far it may pay to increase the intensiveness of production by additional expenditures on labor, food, or manure. There is, all the time, the necessity for detecting and stopping leakages or waste in any direction. In effect, cost accounting is of value to the individual farmer chiefly as a means of checking waste, of *estimating the effects of change* within the system of farming of which the general results, on a certain price basis, are already familiar, and of comparing his achievements with his estimates." (p. 80)

Chapter II is given largely to a discussion of the limits within which data showing product costs may be applied usefully for comparative purposes by research and extension workers. One question raised is, Are data showing the cost of a product on one farm a good index of efficiency when compared with data showing the cost of the same product on other farms? The conclusion in this connection is suggested in the following:

"It has been suggested that comparisons may still be made validly between the costs of producing the same crop on different farms by valuing, on a uniform basis, those residual and intermediate products which form the connecting links between the several crops and the livestock within the farming system. Whatever basis be adopted for making apportionments of costs between grain and straw, milk and manurial residues of foods, and for other adjustments of a similar character, the objection still remains that the real influence of the production of one product on the total profit of the farm is not measured by such means." (pp. 52-53) The limitations of other common measures of efficiency when used in comparing enterprises and systems conducted under dissimilar conditions are pointed out. The outlook is more hopeful if only the data from those farms that are operated under similar conditions are included in the comparisons.

Part 2 of Chapter III is the most constructive section of the entire book. Here a method of attack for research workers is outlined and a large number of illustratives presented showing how accounting data may be effectively used in developing the method of attack. The importance of making an analysis

of entire farming systems and of making comparisons between different systems is emphasized. The illustrations presented in this section are particularly stimulating. Systems of farming followed on farms of approximately equal acreages with similar soils and operated under similar conditions are compared. Bases of making comparisons between systems with unlike resources are also illustrated.

If comparisons are to be made that involve only a part of the systems it is suggested that methods of carrying out essential functions be made the basis rather than the enterprises. It may well be pointed out that if methods of carrying out functions are compared, limitations apply similar to those discussed for comparisons between enterprises. That is, functions are interrelated as are enterprises. In some cases comparisons of methods of carrying out functions may be worth while; in other cases comparisons between enterprises; but in many cases difficulties are experienced in trying to complete comparisons on either basis. However, if enterprises are to be compared the first step is to determine the way in which each functions in the system or systems being considered.

One is led to doubt if the author is familiar with methods of obtaining data from farmers other than by means of accounts. For example, it is suggested in discussing other methods of getting data as to the seasonal distribution of labor "the survey method of approach seems to offer greater advantages than cost accounting." In this country when we have used both the accounting and survey-and-accounting methods for getting data for the same problem the accounts are generally used as the source of data showing seasonal labor distribution.

The book is well worth a careful examination for those interested in getting and using accounting data. The fact that it is written by one outside our own group who has had intimate contact with farm accounting work for a number of years should commend it to American students.

J. B. Hutson

Bureau of Agricultural Economics

The Soils of Cuba, by Hugh H. Bennett and Robert V. Allison. Washington, D.C. Tropical Plant Research Foundation. 1928. With many illustrations and a large soil map in separate pocket.)

It may appear out of place to review in the JOURNAL OF FARM ECONOMICS a book dealing almost wholly with soils, but development of tropical agriculture is of such economic significance and this monumental work deals with the soils and agriculture of this important tropical land in such a fundamental way, that it seems worth while to call the attention of the readers of the JOURNAL to it.

In the tropics one of the greatest agricultural problems is in fitting the crops grown and the cultivation practices to the soils. Most humid tropical soils are not very fertile, less fertile on the whole than soils in the temperate zones. Unlike most temperate zone soils, which are frozen during much of the year and thus rendered more or less impermeable, tropical soils are subject to leaching by all of the rains that fall. Except, therefore, where humid tropical soils are of relatively recent origin, such as those derived from late

lava flows, or such as are subject to rapid erosion, as on mountain slopes, much of the lime, potash and nitrate has been leached out of the soil. In Cuba most of the soils are not of recent origin, nevertheless, there are large areas of fertile soils, and there remain considerable areas of these not used for sugar cane. On the other hand, much cane is grown on poorer soils, for which it is not well adapted. As a consequence, the plantations on these poorer soils have labored under grave difficulties during the recent years of low prices for sugar. It was this situation in part which caused the sugar growers' organization to undertake the soil survey.

This method of attacking the "surplus problem" deserves more consideration by farmers in the United States than has been given to it. There is need of associating land utilization and farm organization surveys with the soil surveys, and of concentrating these surveys for a few years on counties which contain much marginal agricultural land. If this basic agricultural problem is to be dealt with in more than a dilletante manner, such joint surveys should be increased in number, as the technique is perfected, and legislation should be enacted by both the Federal and State governments in the light of these surveys that will facilitate the conversion of the poorest crop land into pasture or forest.

O. E. Baker

Bureau of Agricultural Economics

The Tariff, an interpretation of a bewildering problem, by George Crompton. (New York: Macmillan, 1927. pp. ix, 226, $2.50.)

This volume represents a move in the right direction—an attempt to throw the light of history upon the tariff question. Its main contribution is to the young industries argument for tariff protection. Mr. Crompton shows by a historical analysis running through five chapters why a very long period of time may be required for an industry to be transplanted and become thoroughly established in a country.

The author states that Adam Smith and his contemporaries "were alike under the sway of the revolt against the restraints of the time on industry and trade." While brief references are made to these mercantilistic restrictions of England, and the suggestion is made that her commercial and industrial supremacy in the middle of the nineteenth century was due largely to these early protective measures to her industries and shipping; yet nowhere is this phase of the history of these trade restrictions treated to the extent which its importance to the subject would warrant.

It would appear that no survey of the past and present tariff policy of the United States which ignored the recent reversal of the position of the United States from a debtor nation to the position of a creditor nation, as Mr. Crompton's book does, could lay claim to completeness.

The author, though a protectionist, finds surprisingly little of current free trade theory to reject. This indicates that the differences of opinion and controversies waged in regard to the tariff arise from failure to distinguish between, and to separate, the *principles* bearing upon tariff making—the principles of national economy and international trade—from the *practices* of tariff making. The most radical protectionist must admit the validity of

"the law of comparative advantage," which, reduced to its simplest terms, is a truism. The most ardent free trader must admit the validity of the young industries' argument for protection, properly stated. Likewise, most free traders admit the validity of the argument for some protection of vested interests and to key industries essential to national defense, the argument for protection against dumping, the possibility of the need to use retaliatory duties, and the justice of a duty to offset an internal tax laid on a similar article produced at home.

It is mainly upon the question of the weight to give these principles in actual tariff making that differences of opinions and disagreements arise. For example, the opinions of people differ with regard to what is the proper degree of national self-sufficiency, and whether a given industry should be included in the category of those which should be given protection on that ground. People differ, likewise, as to the length of time a young industry should be given protection, as well as with regard to what industries should be given protection even as "infants."

It appears to the reviewer that the best way to study the problem with the view of determining the best tariff policy for the United States is from the point of view of the economic history, first of the United States, and secondly of the various European countries, particularly England, France, Germany, Spain, Denmark, Holland, and Italy. Such a study should furnish valuable information regarding the results which have followed, and which may be expected to follow in the future, various tariff policies. While some slight suggestions of such a study are found, the book very decidedly is not written from that point of view.

Writers on the subject of the business cycle attach considerable significance to the building of fixed capital in the form of plant and equipment for new industries. It is maintained that the building of such new capital tends to promote a period of national prosperity. The theory is, briefly, that the building of new capital equipment releases savings and bank credit into the hands of wage earners and dealers in raw materials, who use it to buy consumers' goods. Consumers' goods, not having been proportionately increased in quantity, tend to increase in price. This tends to stimulate business activity and accelerate, or prolong the prosperity phase of the business cycle. This theory suggests that one reason why a protective tariff which promotes a new industry in a country may have value has been overlooked by Mr. Crompton, as well as by other writers on the subject of tariff.

The tone of exasperation with which some writers deal with the inability of business men, farmers, and politicians to understand the principles of international trade, and to understand the fallacy that the tariff keeps wages up,[1] leads the reviewer to call attention to the fact that the results of a given cause which most people see are those which are immediate and obvious, and, furthermore, that people often are not particularly concerned about secondary or eventual results, even though they recognize what these later results will be. If business men see foreign products underselling their own in the domestic market, they are compelled (if profit margins are narrow) to reduce costs or to shut up shop. If the former course is pursued, wages may have to

[1] See, for example, Fraser, "Foreign Trade and World Politics," Chapters 2 and 3.

be reduced; if the latter, employees are thrown out of work, with a consequent reduction in consumer demand for goods. These are immediate or the obvious results. It is no comfort to business men in such a situation to be told that they should get into some business in which this nation has an advantage; that the nation can then export more of that product to pay for the goods which the business men are now making, which will then be imported, at lower cost; and that eventually everybody will gain, for the total national dividend will be larger. Business is carried on by individuals for personal gain or profit, and individuals are more concerned about their own present welfare than about the economic welfare of the nation "in the long run."

It is small wonder, then, that the belief has become so common among business men and politicians that a protective tariff helps to keep wages up and keep workers employed, and that domestic producers, whatever their product, are "entitled to" protection which will prevent foreign goods from selling in this country at prices below the cost of production (plus a "reasonable" profit) of domestic producers.

Such a tradition having grown up in this country, for the good and sufficient reasons mentioned, Mr. Crompton's statement that the "agricultural schedules in some cases should be abolished" seems useless. The time has passed when it was politically expedient—or politically possible—to grant tariff protection to some industries and deny it to others, even though such action would be, from the national point of view, desirable.

In brief, no considerable class or group of producers is likely to submit willingly to seeing foreign products sell in this country at prices below the costs of producing their own similar products, *provided* other groups have protection against this condition of foreign competition. It therefore seems likely that more and more there will come to be "protection all around" if there is protection at all; that the nation must stand or fall with a tariff policy which is uniform for all classes, regardless of their products.

F. H. Shelledy

Washington, D.C.

BOOKS RECEIVED

Ashby, A. W. *Economic Conditions in Welsh Agriculture: Suggestions of Some Remedies.* (Aberystwyth: Agricultural Economics Department, University College. 1928. 37 p. 1 s.)

Reprints from the Welsh Journal of Agriculture, vol. IV, 1928:

Jones, J. Morgan. *Factors affecting the price of pigs in Wales.*

Lewis, Thomas. *Potato and root crops on Welsh farms. Analysis of cost, 1926.*

Shimmin, Arnold N. *The production and marketing of wool in Wales.*

Wynne, R. Harding. *Prices of dairy cows and dairy produce.*

Gordeef, G. S. *Decline of the Land-owning Farmers in the United States.* (Moscow: International Agrarian Institute. 1928. 242 p.) [In Russian with summary in English]

BOOK NOTES

Alsburg, Carl and Taylor, Alonzo E. ***The fats and oils: A general view.*** **Stanford University, Calif., Feb. 1928. 103p. (Leland Stanford, Jr., University. Food Research Institute. Fats and oils studies No. 1, Feb., 1928.)**

A thorough economic and statistical analysis of the fats-and-oils trade has long been needed. The importance of these materials as a source of food, feed, and raw material for industry, their marked interchangeability both for each other and for other products, as well as their increasing importance in international trade with the attending problems of increased competition, tariff, restrictions, and the like, render a study of them extremely important and timely.

The Food Research Institute is undertaking extensive investigations in this field and the present volume: "The Fats and Oils: A General View," is the initial publication of the series.

Very properly the first study presents a general survey of the field. A simple and non-technical exposition is given of the nature and sources, technology, conditions and trends of production, consumption and movements in international trade of the various fats and oils. While little that is new is presented in the present treatise, the authors have brought together from diverse sources and interpreted the information essential to a clear understanding of the fats and oils trade, particularly as it affects agriculture and industry.

Students of the problem and economists generally are gratified that a scientific analysis of this problem is to be made and will look forward to future treatises on this subject from the Food Research Institute.—F. F. Elliott.

Wright, Philip G. ***The tariff on animal and vegetable oils.*** **New York: The Macmillan Company, 1928. 347p. (Institute of economics. Investigations in international commercial policies.) 285 W93T.**

The following summary is quoted from the book:

"It may be here stated that the conclusions arrived at in this study with respect to the several oils and fats are as follows:

"The duty on butter is only partially effective; it is beneficial to the dairy industry and burdensome to consumers but by an amount much less than the duty.

"The duty on olive oil is of little importance for protection but has some revenue value. Its magnitude would appear to be chiefly a fiscal problem.

"The duties on flaxseed and on linseed oil benefit oil manufacturers by the full amount of the duty on the oil, and benefit flax growers by an amount much less than the duty on flaxseed. All consumers of paint, linoleum, and other products of linseed oil are burdened by the full amount of the duty on the oil. As the purpose of the combined duties was to benefit farmers and as the flax growers who have benefited constitute less than 1 per cent of all farmers, while all other farmers are burdened, it would appear that the burden even to farmers outweighs the benefit.

"The duty on castor oil beans appears to be devoid of benefit to anybody. If it were removed, the duty on castor oil could be either greatly reduced or removed altogether to the great benefit of all industrial uses of this oil.

"The duties on the fish oils and on the animal fats (lard, tallow, the greases) are nominal. They have practically no effect upon prices or domestic production, and their retention or repeal would appear to be a matter of indifference. It is possible, though doubtful, that the duty on whale oil may be of some benefit to the domestic producers of menhaden oil.

"Finally, the benefit to the dairy interests and to cottonseed and peanut growers—the interests chiefly responsible for the changes in the oils duties—from the duties on cottonseed, peanut, coconut, and soya bean oils, has been at best small, while the burden on oil refiners and soap manufacturers has been considerable. In the case of these oils the burden would seem greatly to outweigh the benefit."

Hatch, Verna L. "Arming the Farm" or "The Religion of Life." A three-act playlet specially prepared to present in an interesting and instructive way the part that the "Social and Educational Department" plays in the building of a greater national life. (Indianapolis: Indiana Farm Bureau Federation. 1927. 33pp. 25 cents.)

Unwin, George. *Studies in economic history; the collected papers of George Unwin* . . . . Ed. with an introductory memoir, by R. H. Tawney. (London: Pub. for the Royal Economic Society, by Macmillan and Co., Ltd., 1927. 490p.)

This volume contains a selection from the unpublished papers left by the late Professor George Unwin, who occupied the Chair of Economic History at the University of Manchester, together with certain of the chapters and articles contributed by him to books and periodicals. There is an excellent introductory account of his life, consisting of 74 pages. The book itself is divided into three parts devoted respectively to (1) The study and teaching of economic history, (2) Essays and lectures on historical subjects, and (3) Miscellaneous papers, among which are Thoughts on Society and the State, Thoughts on Political Idealism, The God of History, and The Philosophy of Value.

Knight, Melvin M. *Economic history of Europe to the end of the middle ages.* London: G. Allen and Unwin, Ltd. [1926?] 260p.

Knight, M. M., Barnes, H. E., and Flugel, F. *Economic history of Europe in modern times.* Boston, New York [etc.]: Houghton Mifflin Company [1928] 808p.

"We have needed for some time a short work in which the results of the research of specialists in the many different parts of the broad field of the economic history of Europe are synthesized, summarized, and put into a continuous narrative. Taken together, these two manuals fill this need very well."—E. E. Edwards.

RECENT STATE PUBLICATIONS

Compiled by Mary F. Carpenter, Library, Bureau of Agricultural Economics, U. S. Dept. of Agriculture

ARKANSAS

Campbell, C. E. An economic study of tomato production for canning in Arkansas. (Ark. Agr. Exp. Sta., Fayetteville. Bul. 225. 1928. 27p.)

CALIFORNIA

California. Agricultural experiment station, Berkeley. Hilgardia, v. 3, no. 12, June, 1928, p. 305-338.

Contents: Factors affecting the price of watermelons at Los Angeles; Factors affecting the price of Gravenstein apples at Sebastopol. Both of these articles are by Emil Rauchenstein.

California. Dept. of agriculture, Sacramento. California crop report. 1927. (Special publication 86. 1928. 63p.)

California. Dept. of agriculture, Sacremento. Monthly bulletin, v. 17, no. 4, April, 1928, p. 235-291.

Partial contents: Grading eggs in California, by H. G. F. Hamann; A clearing house for the distribution of California grapes and deciduous fruits, by S. S. Rogers; Report of financial status of Federal-State shipping point inspection service as of February 29, 1928, by W. F. Allewelt.

California. Dept. of agriculture, Sacramento. Statistical report of California dairy products, 1927, and list of California dairy products plants. (Special publication 83. 1928.) 46p.

Shear, S. W. Economic aspects of the pear industry. (Calif. Agr. Exp. Sta., Berkeley. Bul. 452. 1928. 107p.)

"Lack of sufficient available data as a basis for drawing worthwhile conclusions regarding problems of market distribution has made it necessary to omit a study of this important economic phase of the industry."

Wellman, H. R., and Braun, E. W. Series on California crops and prices. Almonds. (Calif. Agr. Exp. Sta., Berkeley. Bul. 453. 1928. 34p.)

COLORADO

Colorado. State board of immigration. Division of agricultural statistics, Denver. Agricultural statistics. 1927. (Bul. 85. 1928. 57p.)

FLORIDA

Florida. Dept. of agriculture, Tallahassee. Agricultural statistics of Florida, 1927. (Quarterly bul., v. 38, no. 3, July, 1928. 131p.)

Florida. State marketing bureau, Jacksonville. Fifth biennial report: from July 1, 1925, to March 1, 1927. 15p.

GEORGIA

Georgia. Dept. of agriculture, Atlanta. Georgia and her resources. (Quarterly bul., Jan.-March, 1928. 234p.)

Part 2, p. 157-234, contains Georgia agricultural statistics, 1926-1927.

Georgia. Dept. of agriculture. Bureau of markets, Atlanta. Standard grades for Georgia peaches. (Bul. 1. 1928. 8p.)

ILLINOIS

Lloyd, J. W., and Newell, H. M. Marketing Calhoun county apples. (Ill. Agr. Exp. Sta., Urbana. Bul. 312. 1928. p.563-612.)

"Without a railroad or a cold-storage plant within the county's borders, with scarcely a packing shed and no marketing organizations, this immense apple crop, averaging 400,000 barrels a year, has found its way into the channels of trade and into the consuming markets."

INDIANA

Cleaver, H. M., Cooper, M. R., and Park, J. W. The Indianapolis apple market. (Ind. Agr. Exp. Sta., Lafayette. Bul. 322. 1928. 38p.)

Gaylord, F. C., and Cleaver, H. M. Grading tomatoes for quality. (Ind. Agr. Exp. Sta., Lafayette. Bul. 317. 1927. 24p.)

Overton, M. H. What is happening to agriculture in northwestern Indiana? (Ind. Agr. Exp. Sta., Lafayette. Bul. 321. 1928. 47p.)

Shows the changes in farming methods and trends of production.

Wiley, J. R. Death and crippled losses in shipping hogs to market. (Ind. Agr. Exp. Sta., Lafayette. Bul. 318. 1927. 32p.)

Young, E. C., and Day, O. A. Prices of farm products in Indiana. (Ind. Agr. Exp. Sta., Lafayette. Bul. 320. 1928. 24p.)

IOWA

Bentley, R. C. Movement of Iowa's commercial corn and oats. (Iowa. Agr. Exp. Sta., Ames. Bul. 252. 1928. p.333-383.)

Includes graphs and tables showing statistics by counties.

KANSAS

Green, R. M., and Stokdyk, E. A. Judging price risks in marketing hogs. (Kan. Agr. Exp. Sta., Manhattan. Circ. 137. 1928. 29p.)

Kansas. State board of agriculture, Topeka. Report . . . . for the quarter ending December, 1927. (v. 46, no. 184. 77p.)

"Devoted to Kansas statistics. Containing tables showing the state's population by counties and cities, acres, yields and values of agricultural products, and numbers and value of live stock, for the year 1927, together with other tables showing yields and values of numerous productions for twenty years."

MAINE

Reed, D. W. Good management increases poultry profits. (Me. Univ. Col. of Agr. Ext. Service, Orono. Bul. 176. 1928. 8p.)

Contains data resulting from a study of accounts kept by Maine poultryman for five years.

MASSACHUSETTS

Jefferson, L. P. The McIntosh apple on the New York market. (Mass. Agr. Exp. Sta., Amherst. Bul. 243. 1928. p. 190-200)

Mighell, R. L., and Brown, Marian. Type-of-farming areas in Massachusetts. (Mass. Agr. Exp. Sta., Amherst. Bul. 244. 1928. p. 254-268)

Mighell, R. L. Factors affecting returns from potatoes in Massachusetts. (Mass. Agr. Exp. Sta., Amherst. Bul. 240. 1928. 95p.)

Yount, H. W., Branch, F. H., Mighell, R. L., and Rowe, H. B. Potatoes in Massachusetts farm economy. (Mass. Agr. Col. Ext. Service, Amherst. Ext. leaflet 119. 1928. 16p.)

MICHIGAN

Horner, J. T. The Detroit milk market. (Mich. Agr. Exp. Sta., East Lansing. Spec. Bul. 170. 1928. 61p.)

Michigan. Agricultural experiment station, East Lansing. Quarterly bulletin, v. 11, no. 1, August, 1928. 42p.

Factors affecting farm incomes studied: p. 27-29.

MINNESOTA

Minnesota. Dept. of agriculture, St. Paul. Minnesota annual crop and livestock statistics, 1926-1927. (Bul. 63. 1928. 96p.)

Price, H. B. Marketing country creamery butter by a cooperative sales agency. (Minn. Agr. Exp. Sta., Univ. Farm. Bul. 244. 1928. 45p.)

MISSISSIPPI

Patterson, T. W. The progress of cooperative marketing in Mississippi. (Miss. Agr. and Mech. Col. Ext. Dept., A. & M. College. Ext. Bul. 48. 1928. 15p.)

MISSOURI

Logan, E. A. Missouri described by districts. (Mo. State Board of Agr., Jefferson City. Bul. v. 26, no. 1. 1928. 24p.)

"Revised from a series of radio addresses over WOS." The districts conform to the nine crop reporting districts.

Logan, E. A., and Mayes, Jewell. Missouri farm census by counties, 1927. (Mo. State Board of Agr., Jefferson City. Bul. v. 25, no. 4. 1927. 16p.)

MONTANA

Bell, E. J., jr. Markets for the farm products of the Billings trade area. (Mont. Agr. Exp. Sta., Bozeman. Bul. 212. 1928. 47p.)

"This study was made during the summer of 1926. The data contained in this bulletin were distributed in mimeographed form in January, 1927."

Patton, P. The relationship of weather to crops in the Plains region of Montana. (Mont. Agr. Exp. Sta., Bozeman. Bul. 206. 1927. 66p.)

"The study was pursued along the following lines: First, a detailed statistical analysis of the forty years of available weather records for the growing season; second, the development of a weather index of the growing season; and third, the application of this index to the development of a crop history for the past forty years."

Montana. Dept. of agriculture, labor and industry, Helena. Montana, v. 2, no. 6, April, 1928.

Contains annual agricultural statistics for 1927.

NEBRASKA

Nebraska. Dept. of agriculture, Lincoln. Nebraska agricultural statistics, 1927. 224p.

NEVADA

Brennen, C. A., and Smith, G. H. Preliminary report on a study of cattle production costs in Nevada. (Nev. Agr. Exp. Sta., Carson City. 1928. 14p.)

NEW HAMPSHIRE

Ackerman, W. T. Electric dairy cold storage. (N. H. Agr. Exp. Sta., Durham. Bul. 233. 1928. 35p.)

Includes costs of refrigeration using natural ice as well as electric refrigeration.

NEW JERSEY

New Jersey. Dept. of agriculture, Trenton. Official proceedings of the thirteenth annual state agricultural convention. (Bul. 53. 1928. 40p.)

The relation of the tariff to agriculture by Hon. W. R. Green is contained on p. 27-36.

Weiss, H. B., and Waller, A. G. Population, industry and agriculture in New Jersey. (N. J. Dept. of Agr., Trenton. Circ. 144. 1928. 36p.)

NEW MEXICO

Walker, A. L. An analysis of the cabbage market with respect to New Mexico conditions. (N. Mex. Agr. Exp. Sta., State College. Bul. 167. 1928. 24p.)

NEW YORK

Booth, J. F. Farmers' cooperative business organizations in New York. (N. Y. Cornell Agr. Exp. Sta., Ithaca. Bul. 461. 1928. 123p.)

Misner, E. G. Economic studies of dairy farming in New York. VIII. Grade B. milk with cash crops and mixed hay roughage, crop year 1924. (N. Y. Cornell Agr. Exp. Sta., Ithaca. Bul. 462. 1928. 38p.)

Warren, G. F., and Pearson, F. A. Interrelationships of supply and price. (N. Y. Cornell Agr. Exp. Sta., Ithaca. Bul. 466. 1928. 144p.)

NORTH CAROLINA

Curtis, R. S., and Meacham, F. T. Methods and cost of raising lambs to marketable age. (N. C. Agr. Exp. Sta., Raleigh. Bul. 253. 1928. 28p.)

Results of an experiment conducted at the Piedmont Branch Experiment Station.

North Carolina. Dept. of agriculture. Division of agricultural statistics, Raleigh. Farm forecaster. Annual graphic issue (no. 50, May, 1928. 12p.)

North Carolina. Dept. of agriculture. Division of agricultural statistics, Raleigh. Farm forecaster. Annual issue (1927) (no. 49, Mar., 1928. 36p.)

NORTH DAKOTA

Miller, R. C., and Benton, A. H. Combine harvesting in North Dakota. Progress report. (N. Dak. Agr. Exp. Sta. Bul. 220. 1928. 26p.)

North Dakota. Agricultural college. Agricultural extension division, Fargo. The North Dakota agricultural highway as determined by the farmers of the state at the economic conferences held during February, 1928. (Circ. 81. 1928. 127p.)

A summary of basic economic facts as used by the committees is given besides the recommendations for an agricultural program for each of seven areas of the state.

Weisner, O. J., Barton, O. A., and McMahon, Don. Turkey production in North Dakota. (N. Dak. Agr. Col. Agr. Ext. Div., Fargo. Circ. 82. 1928. 34p.)

Marketing and cost of growing: p. 15-20.

OHIO

Dowler, J. F. Livestock production costs in Greene county, Ohio. (Ohio. Agr. Exp. Sta., Wooster. Bul. 419. 1928. 52p.)

Ohio. Agricultural experiment station, Wooster. Bimonthly bulletin, v. 13, no. 3, May-June, 1928.

Partial contents: Horses on Ohio farms, by J. I. Falconer, p. 125; Shipments of Ohio potatoes, by C. W. Hauck, p. 126; Poultry and egg prices, by J. I. Falconer, p. 127.

Ohio. Agricultural experiment station, Wooster. Bimonthly bulletin, v. 13, no. 4, July-August, 1928.

Partial contents: variation in income from Ohio's agricultural industry, by V. R. Wertz, p. 157-158; Receipts and expenses on Ohio farms for 1927, by J. I. Falconer, p. 159.

OREGON

Dreesen, W. H. A study in the ratios of assessed values to sale values of real property in Oregon. (Ore. Agr. Exp. Sta., Corvallis. Bul. 233. 1928. 45p.)

PENNSYLVANIA

Hanemann, H. A. Consumer demand for bakery products in fifteen cities of Pennsylvania. (Pa. Dept. of Agr., Harrisburg. General bul. 459. 1928. 57p.)

Lininger, F. F., and Charles, T. B. A study of egg and poultry consumption in Pennsylvania. The nature of consumer demand and the source and quality of the supply. (Pa. Agr. Exp. Sta., State College. Bul. 222. 1928. 23p.)

Pennsylvania. Dept. of agriculture, Harrisburg. County and state agricultural organizations with dates and places of fairs—1928. (Bul. 462. 1928. 28p.)

Weaver, F. P., and Washburn, R. S. Farm adjustments in market hay areas of Pennsylvania. Pa. Agr. Exp. Sta., State College. (Bul. 223. 1928. 19p.)

RHODE ISLAND

Corbett, R. B. Sources of carload receipts of food in Providence, Rhode Island, 1921-1925. (R. I. Agr. Exp. Sta., Kingston. Bul. 215. 1928. 106p.)

A preliminary summary of some of the data in this publication was issued as bulletin 211.

TEXAS

McNess, George T. Peanuts in Texas. (Texas Agr. Exp. Sta., College Station. Bul. 381. 1928. 23p.)

VIRGINIA

Vernon, J. J., and Kifer, R. S. The market for milk in Richmond, Virginia. (Va. Agr. Exp. Sta., Blacksburg. Bul. 263. 1928. 15p.)

Contents: The territory supplying milk to Richmond.—The adaptation of the area to dairying.—Quantity of milk.—The market for milk.—The consumption of butter, ice cream, and cheese.—The trend of production and consumption.

Virginia. Dept. of agriculture. Division of agricultural statistics, Richmond. Virginia farm statistics. 1927. (Bul. 5. 1928. 80p.)

WASHINGTON

Taylor, E. A., and Yoder, F. R. Rural social organization of Clark county. (Wash. Agr. Exp. Sta., Pullman. Bul. 225. 1928. 52p.)

The third of a series in cooperation with the U. S. Bureau of Agricultural Economics.

WEST VIRGINIA

West Virginia. Dept. of agriculture, Charleston. West Virginia agriculture. (Bul. 73. 1928. 87p.)

Besides short sketches of different phases of agriculture in West Virginia this contains crop and livestock statistics for a series of years.

West Virginia. Dept. of agriculture, Charleston. West Virginia farm statistics 1870-1928. May, 1928. 55p.

WISCONSIN

Hibbard, B. H., and others. Tax delinquency in northern Wisconsin. (Wis. Agr. Exp. Sta., Madison. Bul. 399. 1928. 28p.)

Kolb, J. H., and Wileden, A. F. Special interest groups in rural society. (Wis. Agr. Exp. Sta., Madison. Research bul. 84. 1927. 109p.)

McNall, P. E., and Ellis, L. S. Farm costs and practices in the production of Walworth county crops and livestock. (Wis. Agr. Exp. Sta., Madison. Research bul. 83. 1928. 103p.)

WYOMING

Wyoming. Agricultural college. Division of extension. An agricultural program for the Shoshone project of Wyoming. (Circ. 25. 1928. 38p.)

Wyoming. Dept. of agriculture, Cheyenne. Wyoming agricultural statistics, number five. 1927. 88p.)

Publications from the Bureau of Agricultural Economics.[1]

Issued June 11—September 15, 1928

TECHNICAL BULLETINS

68 Ranch organization and methods of livestock production in the Southwest, by V. V. Parr, G. W. Collier and G. S. Klemmedson.

This bulletin does for the Southwest (cattle and goat ranches) what Technical Bulletin 45 noted in the July issue (p. 415) did for the northern Great Plains Region; planned and carried out by the same staff members.

69 Marketing American cotton in England, by A. B. Cox.

78 Marketing American cotton on the Continent, by A. B. Cox.

These two bulletins, together with Department Bulletins 1444, Cotton prices and markets, and 1445, Services in cotton marketing, previously published, form a series which was planned to tell the whole story about cotton marketing. Dr. Cox spent several months abroad to get at first hand much of the matter used in these bulletins.

73 Some factors affecting the demand for milk and cream in New York City, by H. A. Ross.

It is always a question for distributors how much milk they shall buy, and producers organized to do shipping and converting at the shipping-points too are keenly interested in knowing pretty definitely what factors that can be measured do affect demand for milk and cream and how much. Seasonal, regional, weather, day-of-the-week, holiday variations are among those measured in this study.

FARMERS' BULLETINS

1564 Farm budgeting, by J. B. Hutson.

The author explains to farmers the advantages of doing for their farms just what has now become common practice in many other lines of business—look ahead to what is likely to result from the usual practices, and then inquire what may be done in the way of small shifts based on experience, or outlook information, or both, to enhance profits. Forms are presented to give the ideas concreteness.

1378 Marketing eggs, by R. R. Slocum.

Revised edition.

CIRCULARS

28 Market classes and grades of vealers and calves, by D. J. Slater.

44 Marketing California grapes, by E. W. Stillwell, and W. F. Cox.

An unusually complete statistical record of the distribution of the 1927 crop of California grapes marketed fresh.

SERVICE AND REGULATORY ANNOUNCEMENT

111 Regulations for warehousemen storing cold-pack fruit.

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[1] Periodicals and mimeographed preliminary reports are not included. Notes by S. W. Mendum.

TENTATIVE PROGRAM FOR THE ANNUAL MEETING
Stevens Hotel, Chicago, Ill.

Wednesday, December 26

Morning session; Theme—*Formulating the outlook and carrying it to the farmer.*

1. Continuous economic information continuously available to farmers.—Carl Williams, Editor, *Oklahoma Stockman and Farmer.*
2. Research problems involved in providing continuous economic information to farmers.—Jesse W. Tapp, National Investors Company, New York.
3. The problem of encouraging the farmer to take it and use it.—V. B. Hart, Cornell University.
   Discussion by Dean Thomas P. Cooper, University of Kentucky.

Afternoon session; Theme—*Prices of agricultural products* (Joint session with American Statistical Association).

1. A summary of progress in price analysis and an appraisal of success in price forecasting.—O. C. Stine, Bureau of Agricultural Economics.
   Discussion by
   Holbrook Working, Food Research Institute, Stanford University
   Walter P. Hedden, Port of New York Authority
2. To be announced.

Evening session; Round table number 1. Theme—*Agricultural readjustments in particular industries.*

1. The issues involved in the readjustment of farm organization and management in the Cotton Belt.—J. D. Pope, Alabama Polytechnic Institute.
   Discussion by
   R. J. Saville, North Carolina Experiment Station
   O. M. Johnson, Bureau of Agricultural Economics
2. Analysis of the relations of quality and price of cotton.—B. Youngblood, Bureau of Agricultural Economics.
   Discussion by
   G. L. Crawford, Texas A. and M. College
   Alonzo Cox, University of Texas
3. Economic problems of the apple industry.
   Symposium by
   G. P. Scoville, Cornell University
   M. R. Cooper, Bureau of Agricultural Economics

Round Table number 2. Theme—*Land utilization and tenure.*

1. Results of regional replanning study in the mountains of West Virginia as illustrative of the scope, methods, and practical results of such studies.—Paul Eke, University of West Virginia and Millard Peck, Bureau of Agricultural Economics.
2. Problems in determining the economic feasibility of forest uses.—W. N. Sparhawk, Forest Service.
   Discussions of both papers
   L. M. Vaughn, Cornell University
3. Tenure and financial progress of farmers in selected Southern areas.—J. T. Sanders, Oklahoma A. and M. College.

Thursday, December 27

Business meeting.

Morning session; Theme—*The farmer's income* (Joint session with American Statistical Association).

1. Methods and results of the attempt by the Bureau of Agricultural Economics to estimate farm incomes by States.—H. R. Tolley, Bureau of Agricultural Economics.
   Discussion by
   J. I. Falconer, Ohio State University
   C. C. Taylor, Virginia Polytechnic Institute
2. Distribution of farmers' incomes by size.

12:30 P.M. Farm Economics Luncheon

Symposium on the scope and possibilities of the experimental method in agricultural economics—
J. D. Black, Harvard University
M. L. Wilson, Montana Experiment Station

Afternoon session; Theme—*The Outlook for the Large Farm and Its Significance in National Economy.*

1. Economic advantages of large-scale farming in the production of market milk under Eastern conditions.—H. W. Jeffers, Manager, The Walker-Gordon Farms, Plainsboro, New Jersey.
2. Economic aspects of the administration of groups of farms under northern conditions.—E. C. Young, Purdue University.
3. Prospective displacement of the independent family farm by large farm or estate management and the socio-economic consequences.—C. L. Holmes, Iowa State College.
   Discussion by
   C. L. Stewart, University of Illinois
   O. G. Lloyd, Purdue University

Evening session; Round Table No. 1; Theme—*Marketing.*

1. The seasonal adjustments of production and consumption in fluid milk areas.—F. F. Lininger, Pennsylvania State College.
2. Problems in the location of country milk shipping stations.—Leland Spencer, Cornell University.
   Discussion by
   Hutzel Metzger, Bureau of Agricultural Economics
   H. A. Ross, Cornell University
3. Direct packer buying in the marketing of livestock.—Paul M. Miller, Iowa State College.
   Discussion by
   Geo. F. Henning, Ohio State University.
   R. C. Ashby, Illinois Experiment Station
   H. Bruce Price, University of Minnesota

Round Table No. 2; Theme—*New developments in scope and method.*

1. Economics of consumption as a field of research in agricultural economics.—Warren Waite, University of Minnesota
   Discussion by
   Miss Hildegard Kneeland, Bureau of Home Economics
   Dr. Hazel Kyrk, University of Chicago
2. The significance of soil type in farm economy and methods of studying the relationships involved.—I. G. Davis, Connecticut Agricultural College.
   Discussion by B. H. Hibbard, University of Wisconsin.
3. Elements of a cooperative Federal and State program for determining the annual changes in the farm real estate situation.—Ernst H. Wiecking, Bureau of Agricultural Economics.

Friday, December 28

Morning session to be announced.

12:30 P.M. Joint luncheon with Rural Section of American Sociological Association.
Social aspects of Mexican immigration.—Dr. Bogardus, Southwestern Methodist University.
Economic aspects of Mexican immigration.—Dr. Paul Taylor, University of California.

Afternoon session; Theme—*Transportation of farm products.*

1. Economic aspects of the proposed Great Lakes-St. Lawrence Waterway.—E. G. Nourse, Institute of Economics.
   Discussion by W. E. Grimes, Kansas Experiment Station.
2. The farmer's interest in various types of roads as revealed by traffic surveys, and the bearing of this on the financing of road building programs.—J. G. McKay, Bureau of Public Roads.
   Discussion by
   J. L. Tennant, Providence, Rhode Island
   Alexander E. Cance, Massachusetts Agricultural College.

Evening session; Theme—*Some important questions connected with the solution of the national agricultural problem.*

1. An analysis of the problem of handling annual surpluses of non-perishable farm products.—M. J. B. Ezekiel, Bureau of Agricultural Economics.
   Discussion by
   E. M. Daggitt, American Cotton Association
   Eric Englund, Bureau of Agricultural Economics
2. Who gets the benefit of improvements in agriculture?—H. E. Erdman, University of California.
   Discussion by
   T. N. Carver, Harvard University
   A. G. Black, University of Minnesota

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NOV 5 1928

VOLUME X NO. 4

JOURNAL of FARM ECONOMICS

OCTOBER, 1928

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Published Quarterly by
THE AMERICAN FARM ECONOMIC ASSOCIATION
Publication Office: 450 Ahnaip Street, Menasha, Wis.
Executive Office: W. I. Myers, Secretary-Treasurer,
Cornell University, Ithaca, N.Y.

Price: $5 per year, this issue $1.25

Entered as second class matter at the post office at Menasha, Wis.

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